Caution: The Bioer Co. reserves the right to modify this manual at any time without notice.

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Before initial use of this instrument, please carefully read this manual!

File No.: BYQ60630000000ESM

File version: ~~Dec 30~~ ~~July~~ ~~April~~ February ~~February~~ ~~Sep~~ ~~May~~, ~~2009~~ 2012 ~~3~~ ~~11~~ ~~0~~

Version 1.~~2~~ ~~4~~ ~~7~~ ~~8~~ ~~6~~ ~~5~~ ~~3~~

Important Notes

1. Usual practice

Caution:	Important information is contained in any item and should be carefully read. Failure to observe the instruction would result in damage or abnormal function of instrument.

Warning!	The warning message requires extremely careful operation of a certain step. Failure to observe the instruction would result in serious personal injury.

2. Safety

During operation, maintenance and repair of this instrument, the following basic safety notes shall be observed. In case of failure to follow these measures or the warnings or notes indicated herein, the basic protection provided by the instrument, its safety criteria of design and manufacture, and its predicted use range would be impaired.

Hangzhou Bioer Technology Co., Ltd. shall be irresponsible for the consequence resulted from user's failure to observe the following requirements.

Note:	This instrument conforms to Class Ⅰ and Protection Class IP20 of GB4793.1 Standard and it is for indoor use.

a) Instrument earth

In order to avoid electrical shock accident, the input power wire of instrument shall be reliably earthed. This instrument uses 3-core earth plug and this plug is provided with a third (earth) leg, is merely used for earth type power socket and is a safety unit. If the plug is impossible to insert into the socket, the socket shall be correctly fixed by electrician; otherwise, the earth plug would lose safe protection function.

b) Keeping apart from the live circuit

The operator shall not disassemble instrument without permission. Only qualified professionals are allowed to replace elements or adjust the machine inside. Replacement of elements under energizing state shall be prohibited.

c) Use of power supply

Before turning on AC power, make the power voltage consistent with the instrument-required one (a ±10% deviation is allowed). Make the rated load for power socket not below instrument's maximum load.

d) Power wire

Generally, this instrument uses accompanied power wire. The damaged power wire shall be replaced by one of the same type and the same specification. It can't be repaired. The power wire shall neither be compressed nor be laid in gathered personnel location.

e) Insertion and withdrawal of power wire

At insertion and withdrawal of power wire, the plug shall be correctly held with hand. At insertion, the plug shall be completely and tightly inserted into the socket and at withdrawal heavily pulling the wire shall not be allowed.

f) Placement of instrument

This instrument shall be fixed in a low RH and low dust place apart from water source (e.g. water pool and water pipeline) and the room shall be well ventilated, and free of corrosive gas or and interference of strong magnetic field. The instrument shall not be placed in a wet or dusty location.
The openings on this instrument are for ventilation circulation and in order to avoid over-heat of the instrument body they shall not be blocked or covered. When a single set or several sets of instrument

are used, the interval between its surrounding ventilation opening and its nearest object shall not be below 50cm or 100cm. Also, don't use the instrument on loose or soft surface, or the air inlet at instrument bottom might be blocked.

Excessive temperature would impair the test performance or result in fault of instrument. This instrument shall not be used in location subjected to direct sunshine. The instrument shall be kept away from hot gas, stove and all other heat source.

If the instrument is to be set aside for a long time, the power plug shall be withdrawn and the instrument covered with soft cloth or plastic film to avoid entrance of dust.

g) Notes during operation

During test, cares shall be taken to prevent liquid from dropping onto the instrument.

Caution: In any of the following cases, immediately cut off the power supply, withdraw the power plug from the power socket, contact the supplier or ask qualified repair personnel for treatment:

- Liquid drops into inside of the instrument.
- The instrument is rained or watered.
- The instrument works abnormally, especially generates abnormal sound or odor.
- The instrument is dropped or its casing is damaged.
- The function of instrument obviously changes.

3. Instrument label

Warning! The instrument is adhered with mark "HOT SURFACE!" During operation of instrument or a period immediately after completion of running of a program, any portion of body shall not be contacted with metallic portion (module or hot-lid) nearby the said mark; otherwise skin would be burnt.

4. Maintenance of instrument

In order to ensure full contact and good heat conduction between the test tube and the conical holes, the conical hole on the module shall be regularly cleaned with clean soft cloth soaked with a little absolute alcohol. The stained surface of this instrument, if any, shall be cleaned with soft cloth soaked with cleaning paste.

Warning! At cleaning of instrument, its power supply shall be cut off.
The instrument surface shall not be cleaned with corrosive cleaning agent.

5. After-sales service

The warranty content and scope are shown in the warranty sheet.

Note:

- After unpacking, immediately check the goods against the packing list. In case of damaged or missed goods, please immediately contact the supplier.
- After qualification of acceptance, properly fill the product acceptance sheet and send (or fax) the copied sheet to the supplier for filing and maintenance.
- After unpacking, the packing box and packing materials shall be well kept for future repair. For the damage of instrument occurring during transporting to the repair department due to improper package, Hangzhou Bioer Technology Co., Ltd. shall bear no liability.

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Chapter I Introduction

The contents in this chapter include introduction of PCR technology, examples of PCR application, introduction of Thermal Cycler and features of LifePro Thermal Cycler.

1. Introduction of PCR technology

Polymerase chain reaction (PCR) is a nucleic acid amplification that simulates natural DNA replication in vitro. It takes 2 DNA chains to be amplified as template, uses a pair of artificially synthesized oligonucleotide primer as mediator, and amplifies certain DNA fragment quickly and specifically by thermostable DNA polymerase. Ever since PCR technology was invented by Mullis in 1985 and thermostable DNA polymerase was discovered by Erlich in 1988, this simple, fast, specific and sensitive technology has been widely applied to life science areas with astonishing speed. Remarkable achievements have been witnessed in cytology, virology, oncology, genetic disease, forensic medicine, animal/plant immunology and etc. It is a milestone in contemporary molecular biology development.

2. Example of PCR technology application scope

- **Research:** gene clone, DNA sequencing, mutation analysis, gene recombination and fusion, protein-regulating DNA sequence identification, transposition insertion site mapping, genetic modification detection, synthetic gene construction, clone construction, carrier expression, certain gene's incision enzyme diversity detection and etc.
- **Clinical diagnosis:** bacteria (spirochete, mycoplasma, Chlamydia, mycobacterium, rickettsia, diphtheria bacillus, pathogenic E. Coli, dysentery bacillus, aeromonas hydrophilic and C. difficile and etc.); virus (HTLV, HIV, HBV, HCV, HPVS, EV, CMV, EBV, HSV, measles virus, rotavirus, parvovirus B19 and etc.); parasite (malaria and etc.); human genetic disease (Lesh-Nyhan syndrome, Mediterranean anemia, hemophilia, BMD, DMD, cystic fibrosis and etc.)
- **Immunology:** HLA typing, T cell receptor or antibody diversity qualification, autoimmune disease gene mapping, lymphokine quantification and etc.
- **Human genome project:** DNA mark generated from scatter repetitive sequence, genetic map construction (detect DNA, polymorphism, sperm drawing), physical map construction, sequencing, expression map and etc.
- **Forensic medicine:** crime scene specimen analysis, HLA-DQ$_\alpha$ analysis and etc.
- **Oncology:** pancreas cancer, rectal cancer, lung cancer, thyroid cancer, melanin cancer, hematological malignant tumor and etc.
- **Histology/population biology:** genetic cluster research, evolution research, animal protection research, ecology, environmental science, experimental genetics and etc.
- **Paleontology:** archeology and museum specimen analysis and etc.
- **Botany/zoology:** animal inflectional disease diagnosis, plant pathogen detection and etc.

3. Features of LifePro Thermal Cycler

LifePro Thermal Cycler is a PCR instrument with multiple functions and several applications. Below are its features:

- Use advanced thermoelectric refrigeration technology from ITI of US and thermoelectric refrigeration elements made under quality management of Japan, which are steady and reliable in quality.
- Temperature can be changed as fast as 4°C /second. The speed to increase or decrease temperature can be set as per need of experiment.
- Several modes for temperature control, better compatibility of reagent.
- Large LCD screen, user-friendly operation interface, simple and easy operation
- Power-off protection available, programs can continue after power recovery.
- Height and pressure of hot-lid can be set for different reaction tubes, which prevent reagent evaporation and pollution effectively.
- Connect to ordinary computer by RJ45 standard interface, which is easy for software upgrading.

4. Use of LifePro Thermal Cycler

Integrating a number of advanced technologies, LifePro Thermal Cycler meets the demand of

different PCR experiments and rank top in similar products.

LifePro Thermal Cycler is attached with:
1) 0.2 ml standard centrifugal tube
2) Strip of 8 tube
3) Strip of 12 tube
4) Full/half apron plates

Chapter II Features

This chapter introduces the usage, transportation, storage conditions of the instrument, as well as its basic parameters, performance and functions.

1. Normal working conditions

Ambient temperature: 10°C ～ 30°C
Relative humidity: ≤70%
Power supply: 220V～, 50Hz

Caution: Before using the instrument, please make sure the working condition meets the above requirements. Especially the power line must be reliably earthed.

2. Transportation and storage conditions

Ambient temperature: -20°C ～ +55°C
Relative humidity: ≤80%

3. Basic parameters

Specification	TC-96/G/H(b)A
Sample size	96×0.2ml,96 micro-plate 12x8 test tube bar,8x12 test tube bar
Scope of temperature	4°C ~ 99°C
Heating Rate(max)	≥4.0°C
Cooling Rate(max)	≥4.0°C
Temperature uniformity	≤±0.2°C（55°C）
Temperature control precision	≤±0.1°C
Temperature fluctuation	≤±0.2°C
Maximum gradient	30°C
Minimum gradient	1°C
Scope of hot-lid temperature setting	30°C ~ 110°C
Scope of hot-lid working temperature	105°C ± 5°C
File saving amount	≥99（pieces）
Energy consumption (maximum input power)	600W
Operation mode	Continuous operation mode
Outline dimension	351mm×279mm×250mm（L×W×H）
Fuse	250V 8A Φ5×20
PC interface	RJ45
Weight (kg)	10

Caution: If the hot-lid temperature setting is lower than module temperature setting, the hot-lid temperature shown on screen is higher than hot-lid setting.

4. Software functions

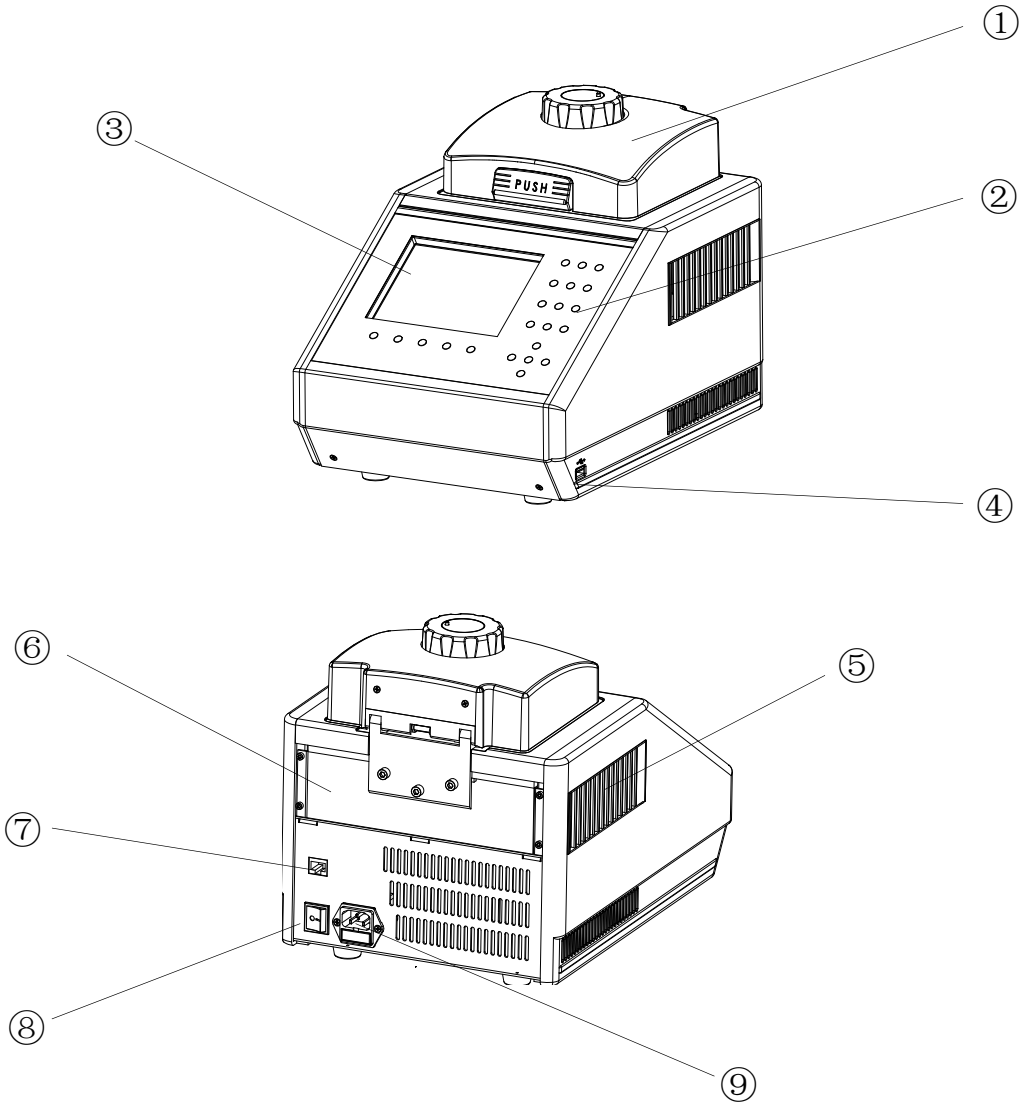
a) Edit the file (including file number, temperature and time of each segment, cycle times setting, file view, revision and deletion, automatic file connection, gradient temperature setting, the maximum paragraph, step and cycle times for editable file are 5, 16 and 99 respectively. The scope for gradient temperature setting is 1°C～30°C.)
b) Save the file
c) Revise the file (adjust the rate for temperature rise/fall, refine temperature and time for cycling automatically, and display and calibrate the time.)
d) Display the temperature, time, cycle times setting and real-time value at file running (including sound prompt, total/rest time estimation for file running, failure protection and alarming.)
e) Stop the file running (including pause the file running, stop the file running, recover automatically after power off.)

Caution: The above-mentioned software function is merely for reference. The software function would be modified without notice.

Chapter III Preparations

This chapter introduces the structure of instrument, keyboard for operation, function of buttons, and preparations before start. Please get familiar with the contents in this chapter for the first time to use this instrument.

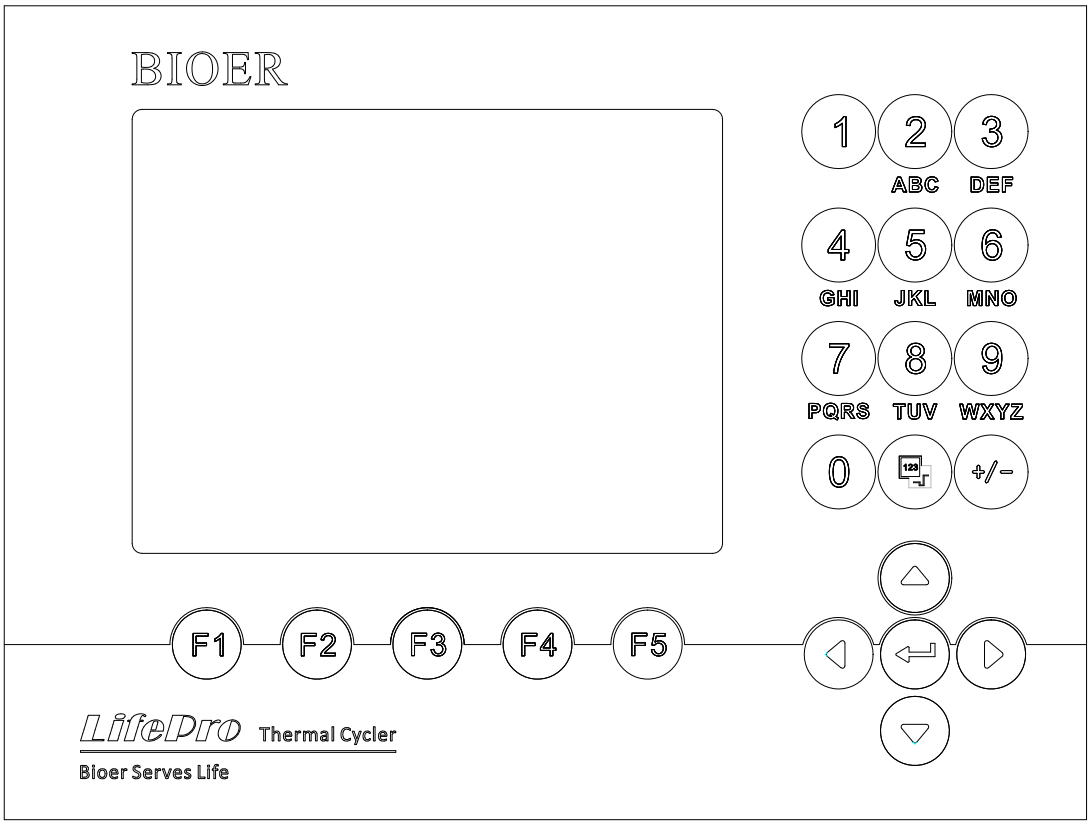
1. Structure diagram



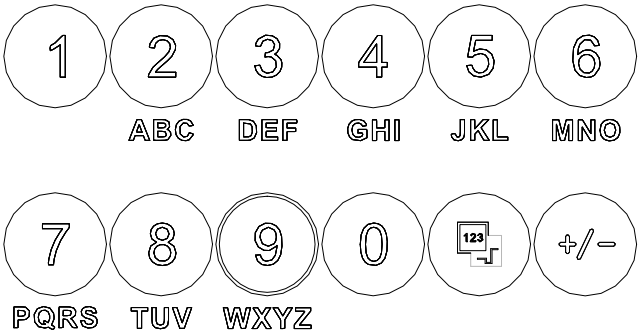
Note: ①Hot-lid ②Keyboard ③LCD screen
④USB interface ⑤Ventilation hole ⑥Block
⑦RJ45 interface ⑧Power switch ⑨Power socket (with fuse)

Caution: The fuse specification must be 250V, 8A, Φ5×20. Use qualified product to replace the fuse. Contact fuse supplier or manufacturer when necessary.

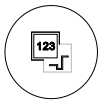
2. Keyboard diagram



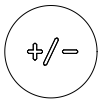
3. Instruction for buttons



Character key: to input characters, press button continuously to input letters.



Display mode switch key: switch display mode between curve and text during running.



Plus/minus key: switch the plus/minus for program temperature editing and time refining.

Cursor left/right key: press once to move the cursor left/right.
Cursor up/down key: press once to move the cursor up/down.

Confirmation key: press button to accept the setting value on screen at file setting.

Menu key: press button to accept the item above the button on screen.

4. Check before start

Check the following before insert the plug and power on the instrument:

1) Whether the voltage of power supply matches the voltage required by instrument. (see Chapter II for requirements of power supply)
2) Make sure the power line pug has inserted in power socket reliably.
3) Earth the power line reliably.

5. Start

Power on, (turn power to "-"), the amplifier gives a "du-du" sound, and the fan starts to run, which indicates the power supply is available.

"**Self testing•••••**" is shown on screen, and then the instrument takes about 1 to 2 minutes for self testing. Please wait with patience. The main interface appears if no problem is found, then you can edit, view, modify or delete the PCR amplification file.

Chapter IV Instruction for operation

This chapter explains how to edit, view, modify and delete the PCR amplification file, how to run PCR amplification file, and how to set the instrument system parameters in detail.

Warning!	If the instrument sound or display is abnormal after start, or failure alarm and indication is shown during self testing, please turn off the power immediately and contact the supplier.

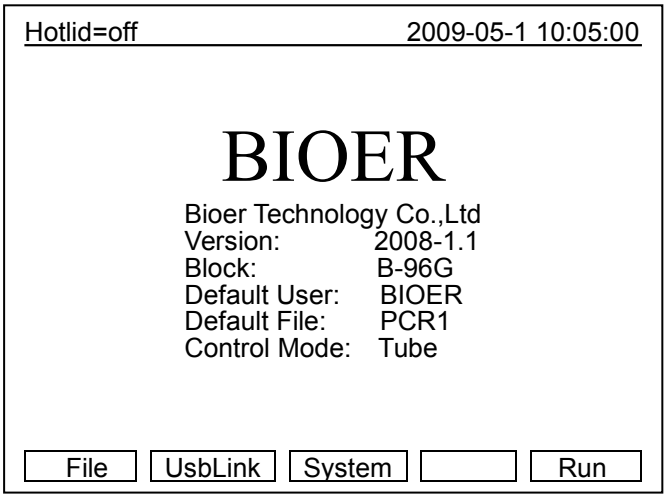
Caution:	If the sample amount for test is less than countersink amount on module, please distribute the sample test tube as uniform as possible. In this way it ensures that the hot-lid presses at the test tube top steadily at file running, the module bears uniform load, and the temperature change in test tubes keeps uniform.

Caution:	Turn the knob at anti-clockwise direction as per diagram before covering the lid (clockwise rotation for pressing, anti-clockwise rotation for loosing) until a "dang-dang" sound is heard. Cover the lid and turn the knob at clockwise direction until a "dang-dang" sound is heard, and then turn another step. When a "dang-dang" sound is heard when knob is rotated at first, regardless of clockwise or anti-clockwise, press the unlocking device by finger, turn the knob at the opposite direction for two steps, and then rotation knob on unlocking device can be released.

1. How to run PCR program

Power on, the thermal cycler gives a "du-du" sound, which indicates the power supply is available. "Self testing **……**" is shown on screen, and the instrument takes about 1 to 2 minutes for self testing. Please wait with patience. The main interface appears if no problem is found.

Main interface



Shown on the upper left of main interface is the status of hot-lid setting.

Shown in the middle of main interface is the information such as the Bioer information, software version, module type, default program, default user, control mode, sample amount and so on.

- ✧ Press "**File**" to access the interface for file list.
- ✧ Press "**System**" to access the interface for system parameter setting.
- ✧ Press "**Run**" to confirm running mode and test tube type if file password is not asked, press "**Run**" to bounce the interface below if file password is asked.

Press **number key** to input the password.

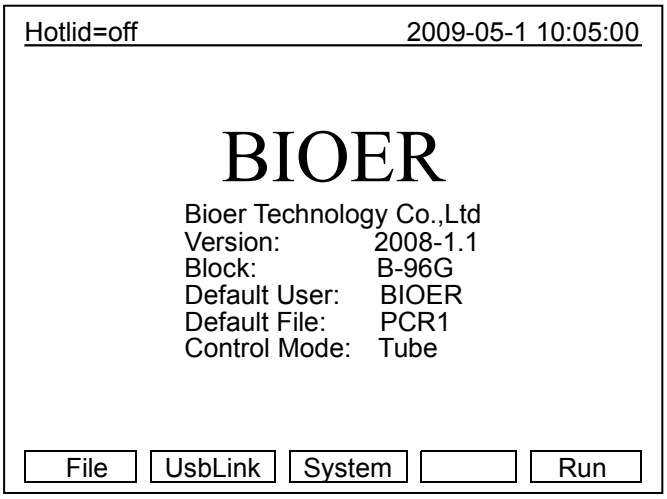
- ✧ Press "**Back**" to return to main interface.
- ✧ Press "**Accept**" to access the interface for file running if Control Mode is Block now, press "**Accept**" to bounce the dialog box for test tube volume setting if Control Mode is Tube now.

Caution:	Turn the knob at anti-clockwise direction as per diagram before covering the lid (clockwise rotation for pressing, anti-clockwise rotation for loosing) until a "dang-dang" sound is heard. Cover the lid and turn the knob at clockwise direction until a "dang-dang" sound is heard, and then turn another step. When a "dang-dang" sound is heard when knob is rotated at first, regardless of clockwise or anti-clockwise, press the unlocking device by finger, turn the knob at the opposite direction for two steps, and then rotation knob on unlocking device can be released.

1. How to run PCR program

Power on, the thermal cycler gives a "du-du" sound, which indicates the power supply is available. "Self testing **……**" is shown on screen, and the instrument takes about 1 to 2 minutes for self testing. Please wait with patience. The main interface appears if no problem is found.

Main interface



Shown on the upper left of main interface is the status of hot-lid setting.

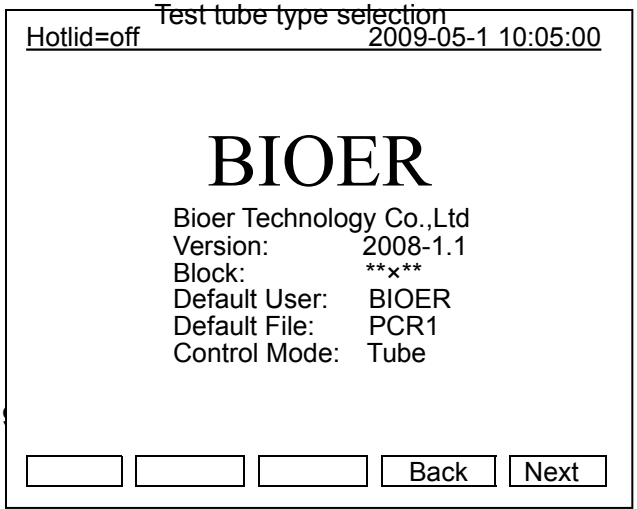
Shown in the middle of main interface is the information such as the Bioer information, software version, module type, default program, default user, control mode, sample amount and so on.

- ✧ Press "**File**" to access the interface for file list.
- ✧ Press "**System**" to access the interface for system parameter setting.
- ✧ Press "**Run**" to confirm running mode and test tube type if file password is not asked, press "**Run**" to bounce the interface below if file password is asked.

Press **number key** to input the password.

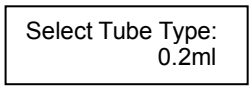
- ✧ Press "**Back**" to return to main interface.
- ✧ Press "**Accept**" to access the interface for file running if Control Mode is Block now, press "**Accept**" to bounce the dialog box for test tube volume setting if Control Mode is Tube now.

Test tube type selection



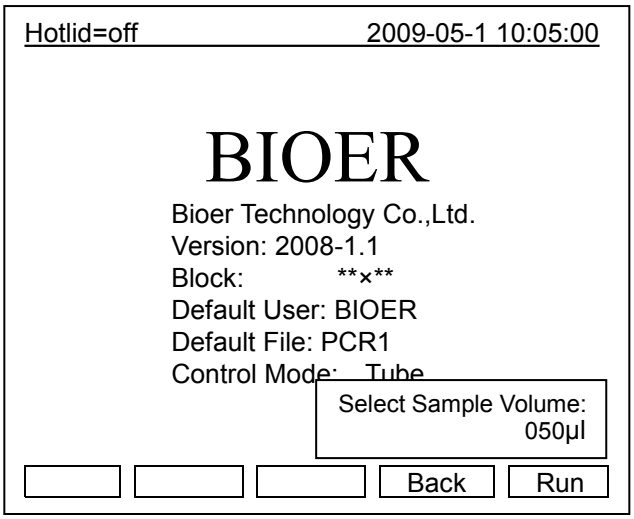
Press to **+/-** select the test tube type in this interface.

- ✧ Press "**Back**" to return to main interface.
- ✧ Press "**Next**" to access the interface for file running if Control Mode is Block now, press "**Next**" to bounce the interface below if Control Mode is in Tube mode now.



Press **Character key** to input the micro liter amount of sample size. Different sample sizes have different overshoot temperature and lasting time when temperature control mode is Tube.

- ✧ Press "**Back**" to return to main interface.
- ✧ Press "**Run**" to access the interface for file running.

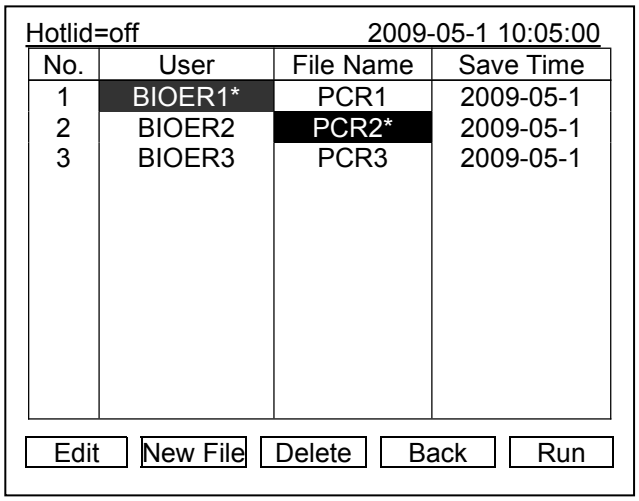


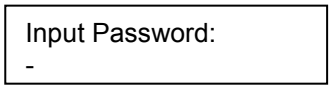
1.1. How to edit PCR program

Press "**File**" in main interface to access the interface for file list. As shown in figure, there are 3 files in the file list. Use the up/down key to select user when blinking bar blinks in the User column, and the file for selected user is shown in the File Name column; shift to File Name by right click, then the blinking bar blinks in the File Name column, select corresponding User file by up/down key.

- ✧ Press "**Edit**" to edit the file pointed by cursor.
- ✧ Press "**New File**" to edit a new file.
- ✧ Press "**Delete**", it asks "Confirm delete file?" select Delete or Back as per information.
- ✧ Press "**Run**" to confirm running mode and test tube type if file password is not asked, press "**Run**" to bounce the dialog box below if file password is asked:

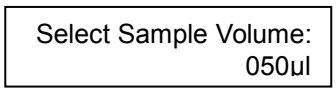
Interface for file list





Press "**Run**" to access the interface for file running when Control Mode is Block; press "**Run**" to bounce the dialog box below if Control Mode is Tube now:

✧

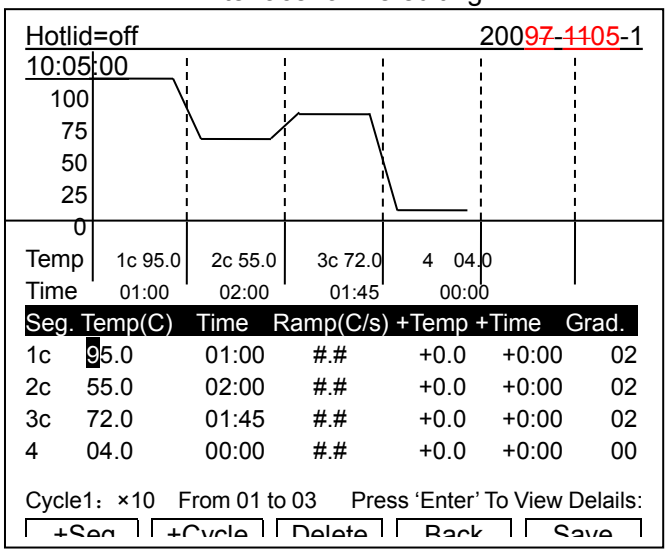


It is the same with main interface, confirm the password, input the sample type and micro liter

amount of sample size.

Note: 1. "*" on upper right of user and file indicates this file is the default for system running.
2. File can be modified in the interface for system parameter setting.

Interface for file editing

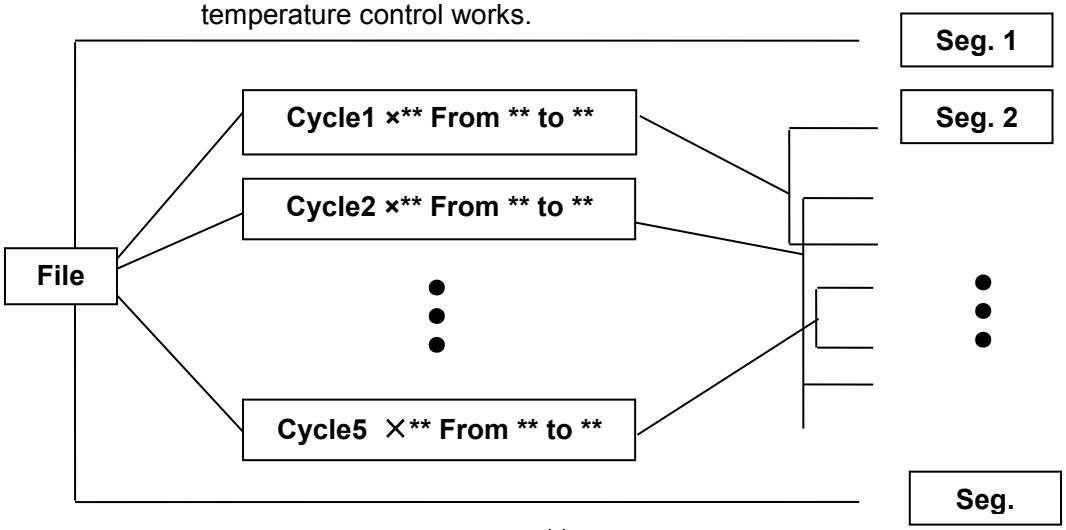


Segment and paragraph can be edited in this interface. The file is comprised of segments and paragraphs, while segments are contained in paragraphs. Cycle times can be set for segments in paragraphs (see figure below for relation). Press **up/down** or **left/right** key to move the cursor, the place where cursor is are highlighted. Press **character key** to change the parameter setting. Press **plus/minus key** to change the plus/minus symbol.

- ✧ Press "**+Seg.**" key for segment editing, where you can set temperature (Temp), lasting time (Time), rate for temperature rise/fall (Ramp), temperature increment in each cycle (+Temp), and time increment in each cycle (+Time) and gradient temperature difference between the left line(at 55C) to the right line(at 57C) in each cycle (Grad.). Press "**Delete**" to delete the segment where cursor is.
- ✧ Press "**+Cycle**" key for paragraph editing, where you can set cycle amount and cycle starting segment. The figure shows that it cycles from segment 1 to segment 3, and cycles for 10 times.
- ✧ Repeat to press "**+Cycle**" key to add paragraphs (maximum is 5). Press "Delete" to delete the current paragraph immediately. Move the cursor up/down to enter previous or next paragraph.
- ✧ Press "**Save**" key to access the interface for file saving.
- ✧ Press "**Back**" key to return to the interface for file list.

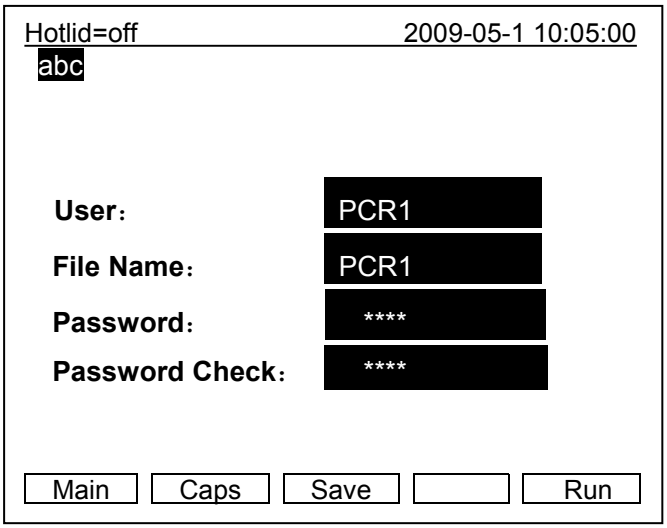
Caution: Meaning of parameters is seen in attachment2.

Special caution: 1. Please save the new edited PCR program before running, or the file can't run.
2. If "Time" is set as "--:--", hot-lid is closed automatically when module temperature control works.



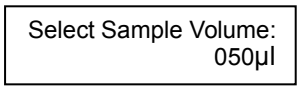
Relation of segment and paragraph in the file

Interface for file saving



Press **character key** in this interface to input file name, press **confirmation key** to move the cursor forward. Select User and File Name by **up/down key**. Delete character by **left key**, move cursor by **right key**. Press **Caps Key** to shift between capital and lower case. At upper left on screen it indicates capital or lower case (as shown in the figure).

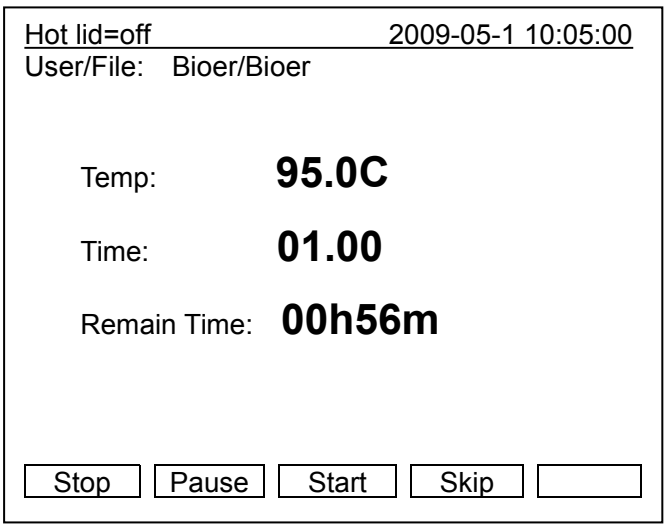
- ✧ Press "**Main**" key to return to main interface
- ✧ Press "**Save**" key to save the file. When file is saved normally, the system shows "File have been saved. Please continue another operation". Press **confirmation key** to make it disappear. If file has the same name with another, the system asks to name again (Rename) or continue to save (Save).
- ✧ Press number key to set and save password.
- ✧ Press "**Run**" to access the interface for file running if Control Mode is Block now, press "**Run**" to bounce the dialog box below if Control Mode is Tube now:



It is the same with main interface; confirm the password; input the sample type and micro liter amount of sample size.

Caution:	1. File name and user name are not case sensitive. 2. Please remember the password. 3. The password should be 0~9 numeric characters.

File running interface 1

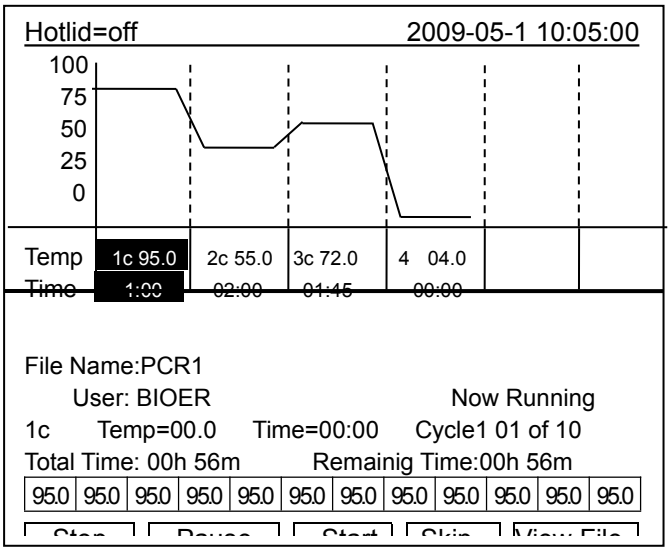


As the file runs normally, "●●●" at Now Running keeps blinking. The system shows "File run over" when running is completed.

- ✧ Press "**Stop**", it shows "Confirm stop running?"
- ✧ Select stop (stop) or continue (Start) as per information.
- ✧ Press "**Pause**", it shows "Now pause running", you can select continue (Start) as per information.
- ✧ Press "**View File**" to view the edited PCR program".
- ✧ Press "**Skip**" to skip the current temperature section and go to the next temperature.

✧ Press to shift between running interface 1 and running interface 2.

File running interface 2



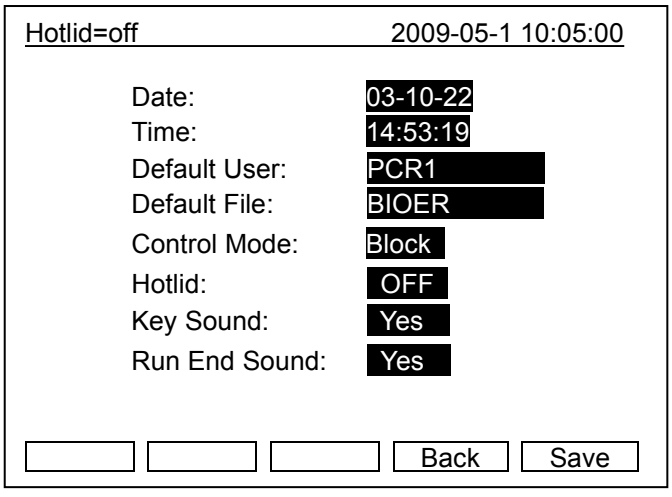
1.2. How to set system parameters

Press "**System**" in main interface to access the interface for system parameter setting. Press **confirmation key** to move the cursor to the next item. Roll and select the items with "⇑⇓" by **cursor up/down key**, or press **character key** to input information for other items, press **cursor left/right key** to move the cursor.

✧ Press "**Back**" to return to main menu.
✧ Press "**Save**" to save parameters.

Special caution: press "Save" to confirm after system parameter setting or the system parameter won't change.

Interface for system parameter setting



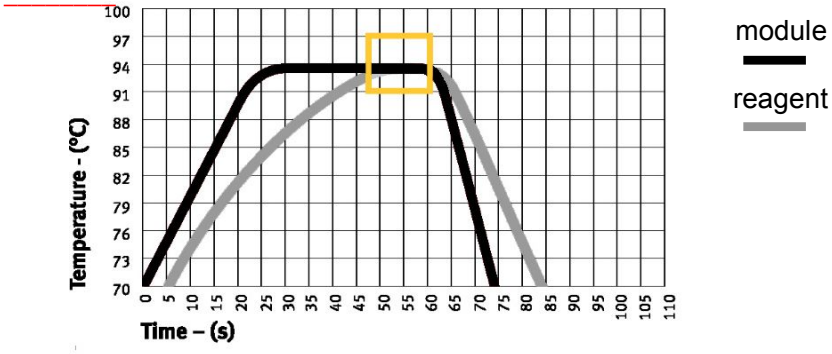
1.2.1 "Date", "Time" indicate the default system time after system start.

1.2.2 "Default File", "Default User" indicates the default running program name and user after system start.

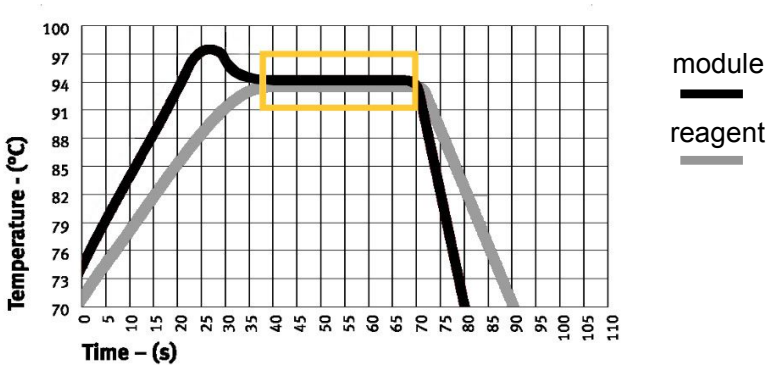
1.2.3 "Control Mode" indicates the default temperature control mode after system start, including "Block" and "Tube" choices.

a) "Block" mode only concerns the temperature control for module during temperature rise/fall. Now that the temperature rise/fall of reagent lags behind the module, the actual

temperature change of reagent is different from the program we set. The actual time that the reagent reaches the set temperature is far less than the set time (see figure below for relation between module temperature and reagent temperature).



b) "Tube" mode considers the temperature rise/fall of reagent that lags behind the module. There is an overshoot when it reaches the set temperature so that the reagent reaches the set temperature faster. At the set time same with "Block" mode, obviously the actual time that reagent reaches set temperature is prolonged. (See figure below for relation between module temperature and reagent temperature.



Note: In the tube mode, timing will start after overshoot is finished, and the temperature will be flashing during overshoot.

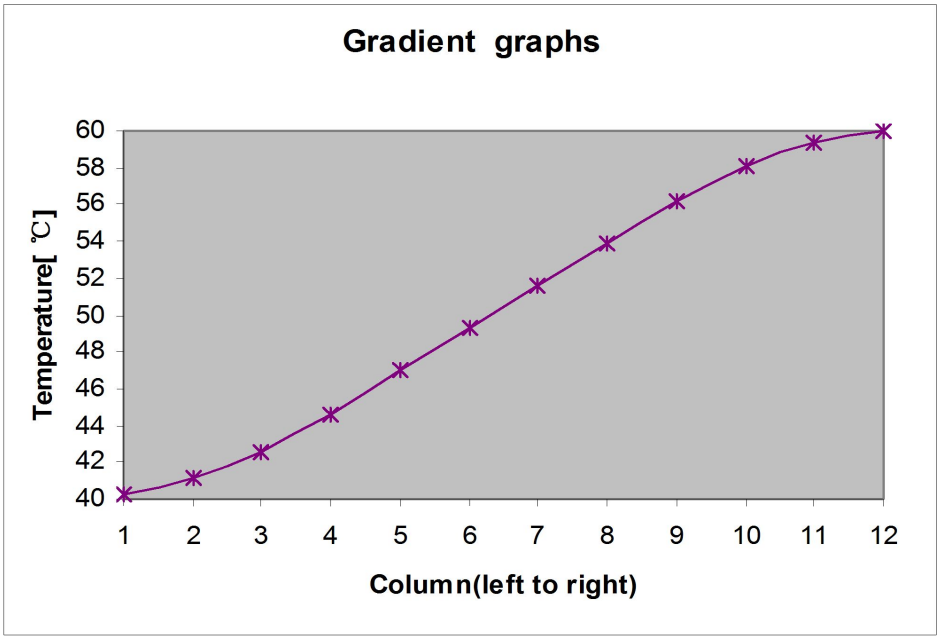
1.2.4 "Hotlid" indicates the on/off status of hot-lid.
1.2.5 "Key Sound" and "Run End Sound" indicate the sound to press key and the sound at program finish respectively.

See attachment 2 (Value and Meaning of Parameter Setting) of this manual for specific index of each parameter above

Caution:	1. Press "Save" to confirm the system parameter setting, or the system parameter won't change. 2. It calibrates the clock inside the instrument as per Beijing time upon ex-factory. 3. It is recommended to check the date and time again for the first time to use.

1.3 Gradient module temperature distribution features

The gradient module uses 3-line temperature control unit. The gradient temperature is distributed as curve, as shown in figure below (the set temperature is 40°C and the set gradient temperature is 20°C.) The temperature gradient in each hole row on module is nor uniform. The temperature difference on hole rows at center is higher than the that at outside. Therefore, at gradient module operation, the temperature of each hole row shown on instrument governs.



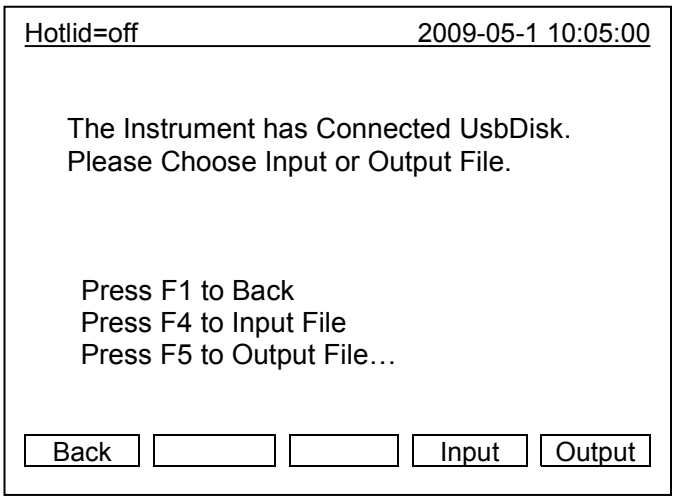
2. How to input/output PCR program

2.1 Connect to USB flash memory

Press "**UsbLink**" in main interface to access the interface for USB connection. If USB flash memory is inserted, as the figure at left shows:

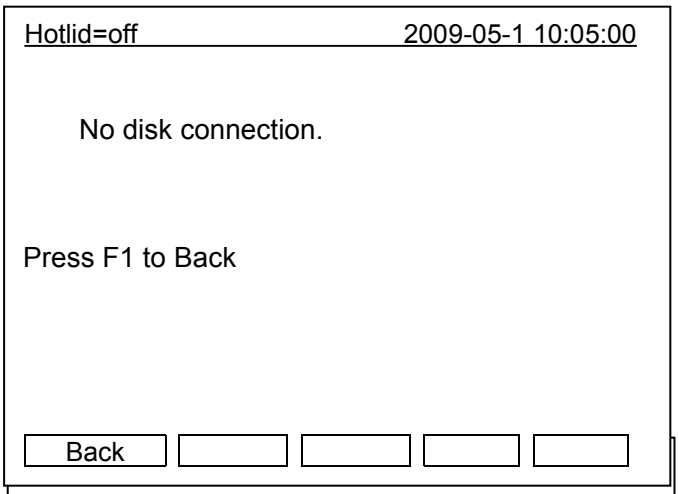
- ✧ Press "**Back**" to return to main interface.
- ✧ Press "**Input**" to select file input from USB flash memory, it shows USB user list.
- ✧ Press "**Output**" to select to output file USB flash memory, it shows local file user list.

USB connection interface



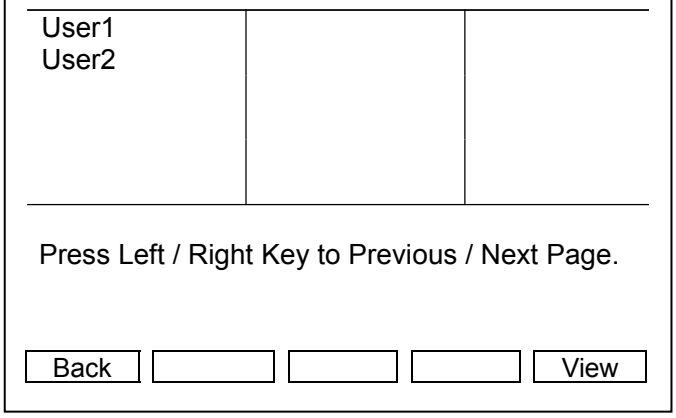
If no USB flash memory is inserted, as the figure at left shows, press "**Back**" to return to main interface.

Interface of USB connection fail



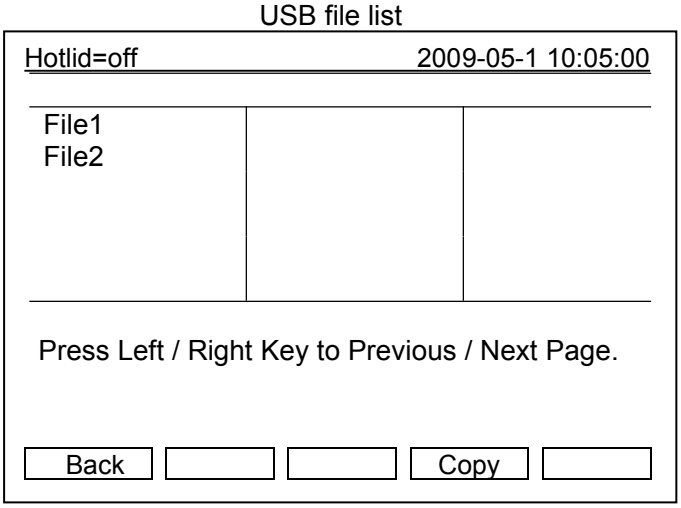
2.2 Input file from USB flash memory

- ✧ Press "**Back**" to return to interface of USB flash memory connection.
- ✧ Press **cursor up/down** to select copy file user.
- ✧ Turn page by **cursor left/right** if user number is more than 30.
- ✧ Press "View" to see USB file list.



USB file list

- ✧ Press "**Back**" to return to interface of USB flash memory user list.
- ✧ Press **cursor up/down** to select copy file.
- ✧ Turn page by **cursor left/right** if user number is more than 30.
- ✧ Press "Copy" to input file.
- ✧ If copy is correct, it shows the dialog box below:



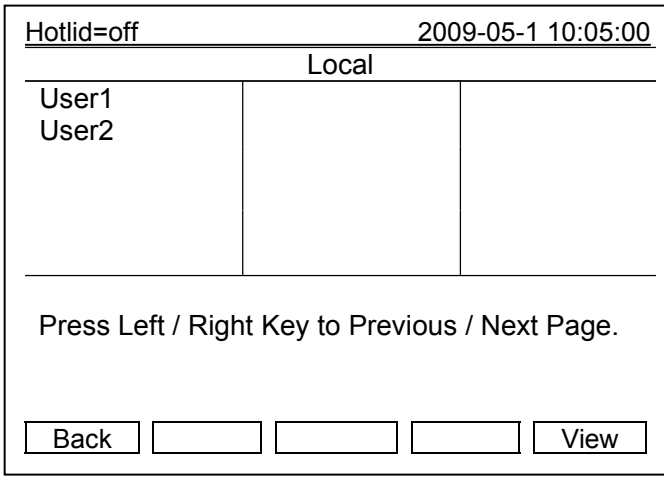
File Saved

If not, it shows:

File input error.

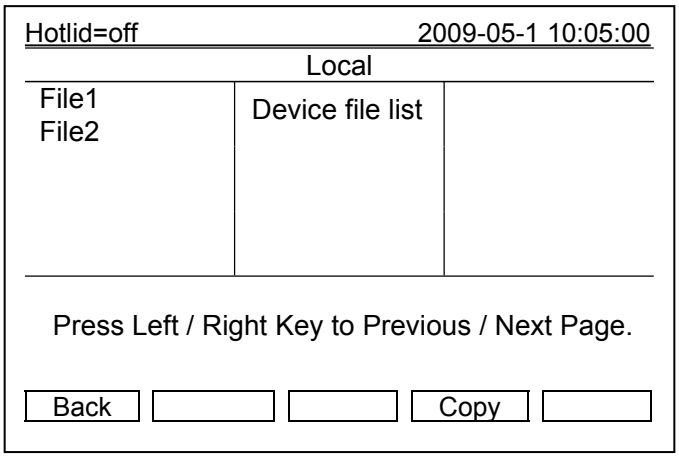
2.3 Output file to USB flash memory

- ✧ Press "**Back**" to return to interface of USB flash memory connection.
- ✧ Press **cursor up/down** to select copy



file user.

- ✧ Turn page by **cursor left/right key** if user number is more than 30.
- ✧ Press “View” to see device user file list.



- ✧ Press “**Back**” to return to interface of **device** user list.
- ✧ Press **cursor up/down key** to select copy file.
- ✧ Turn page by **cursor left/right key** if user number is more than 30.
- ✧ Press “Copy” to output file.
- ✧ If copy is correct, it shows the dialog box below:

  File Saved

  If not, it shows:

  File output error.

Caution:

1. USB reads/writes 500 users, each user has 2,000 files.
2. USB reads/writes ~~bioer~~ pcrex file at USB root directory in fixed directory.
3. Each user is the next subfolder under ~~bioer~~ pcrex file.
4. Don’t plug USB flash memory in/out quickly. To protect device and USB flash memory from damage, the device will terminate the USB function until next run if USB flash memory is plugged in/out quickly.
5. The operation for dual module is same. It only connects USB flash memory at start interface of two modules.
6. Suggest USB flash disk with famous brands, such as KingSton, SanDisk, etc.
7. USB flash disk file system format must be FAT32.
8. Open the instrument first and then insert the USB flash disk.
9. Less USB flash disk files and space, faster the reading.

Chapter V Connection to computer

1. Software installation

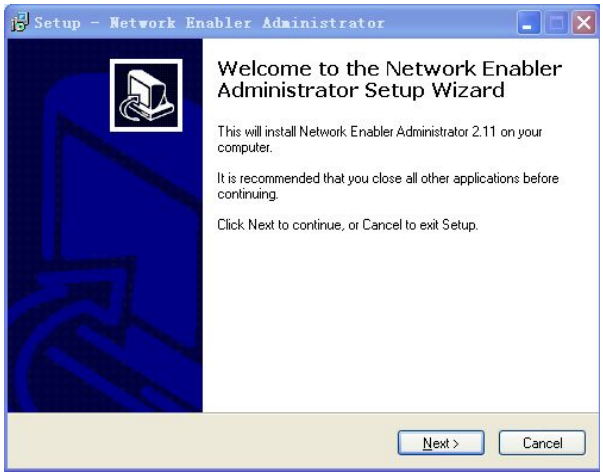
Click "Setup.exe" in accompanied disc; install the LifePro computer connection program, which is able to control 30 LifePro instruments on one computer.

2. Online setting

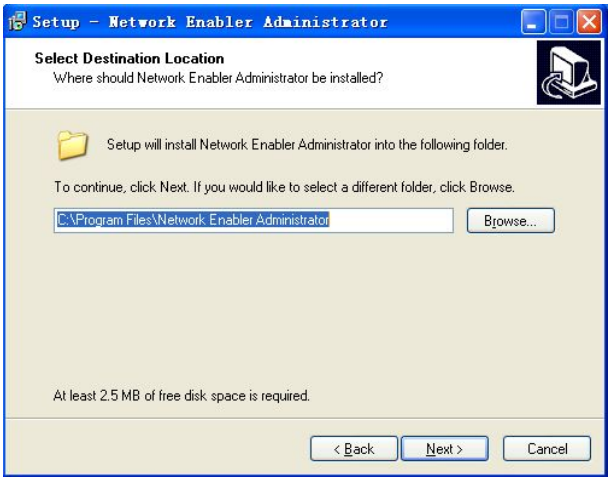
LifePro is equipped with embedded online module inside and tools for setting are available.

2.1 Tool software installation

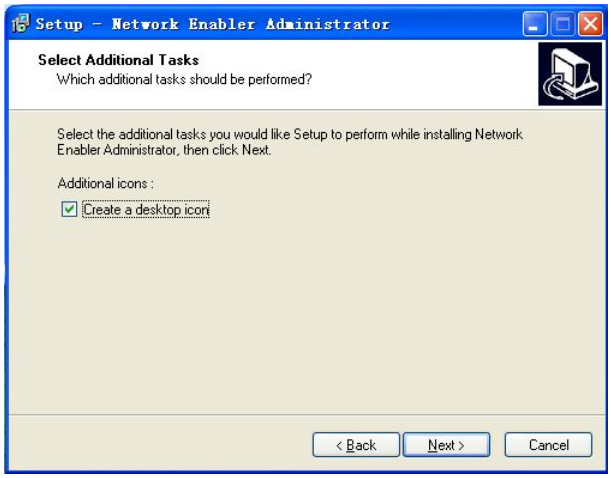
Step 1, click and run nead_setup.exe.


Setup - Network Enabler Administrator
Welcome to the Network Enabler Administrator Setup Wizard
This will install Network Enabler Administrator 2.11 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

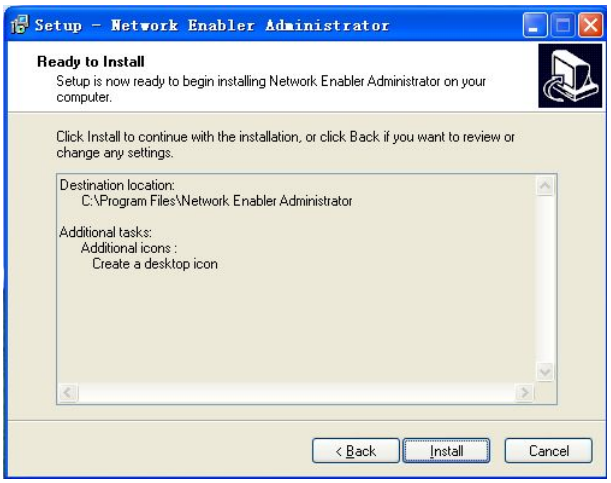
Step 2, click Next.


Setup - Network Enabler Administrator
Select Destination Location
Where should Network Enabler Administrator be installed?
Setup will install Network Enabler Administrator into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\Network Enabler Administrator
Browse...
At least 2.5 MB of free disk space is required.
< Back
Next >
Cancel

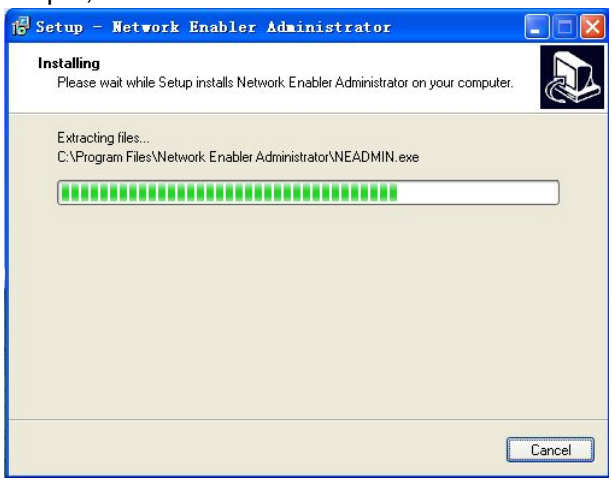
Step 3, select destination location, click Next.


Setup - Network Enabler Administrator
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing Network Enabler Administrator, then click Next.
Additional icons :
Create a desktop icon
< Back
Next >
Cancel

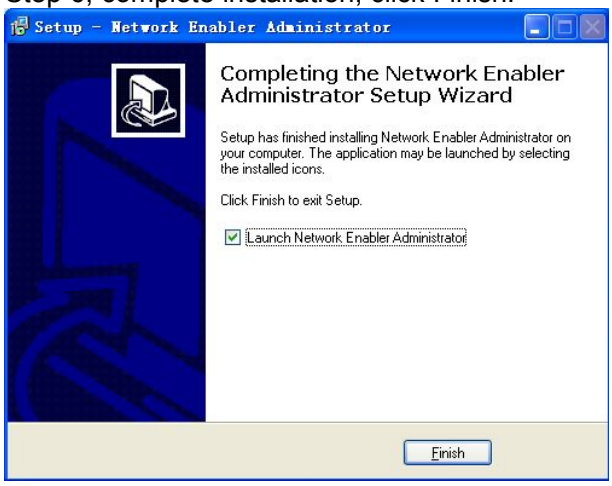
Step 4, Click Next.


Setup - Network Enabler Administrator
Ready to Install
Setup is now ready to begin installing Network Enabler Administrator on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Program Files\Network Enabler Administrator
Additional tasks:
Additional icons :
Create a desktop icon
< Back
Install
Cancel

Step 5, click Install.

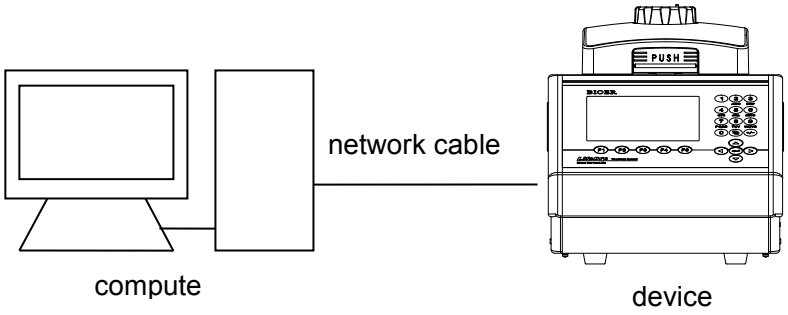

Setup - Network Enabler Administrator
Installing
Please wait while Setup installs Network Enabler Administrator on your computer.
Extracting files...
C:\Program Files\Network Enabler Administrator\NEADMIN.exe
Cancel

Step 6, complete installation, click Finish.

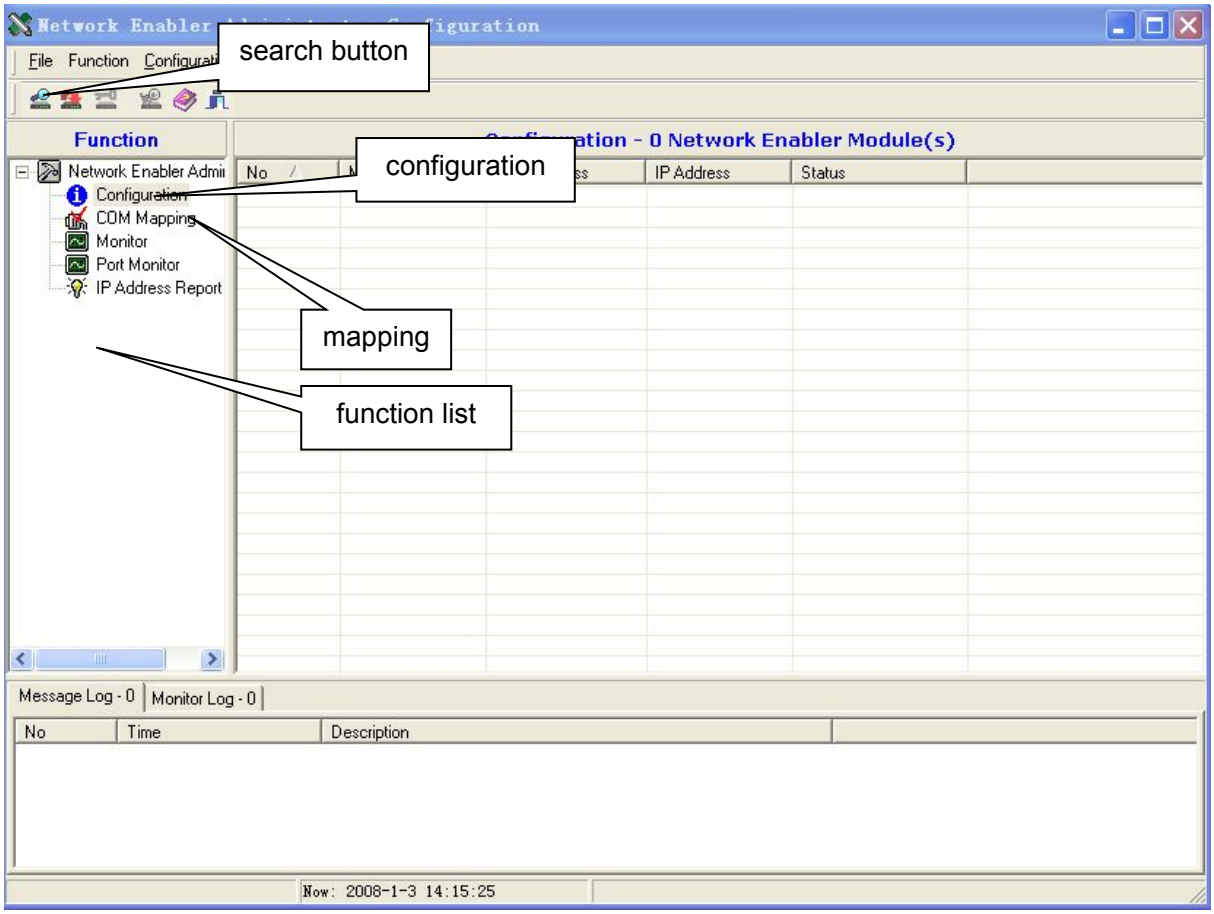

Setup - Network Enabler Administrator
Completing the Network Enabler Administrator Setup Wizard
Setup has finished installing Network Enabler Administrator on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Launch Network Enabler Administrator
Finish

2.2 Device configuration

2.2.1 Connect the device to computer by network cable (cross, B type connection.)

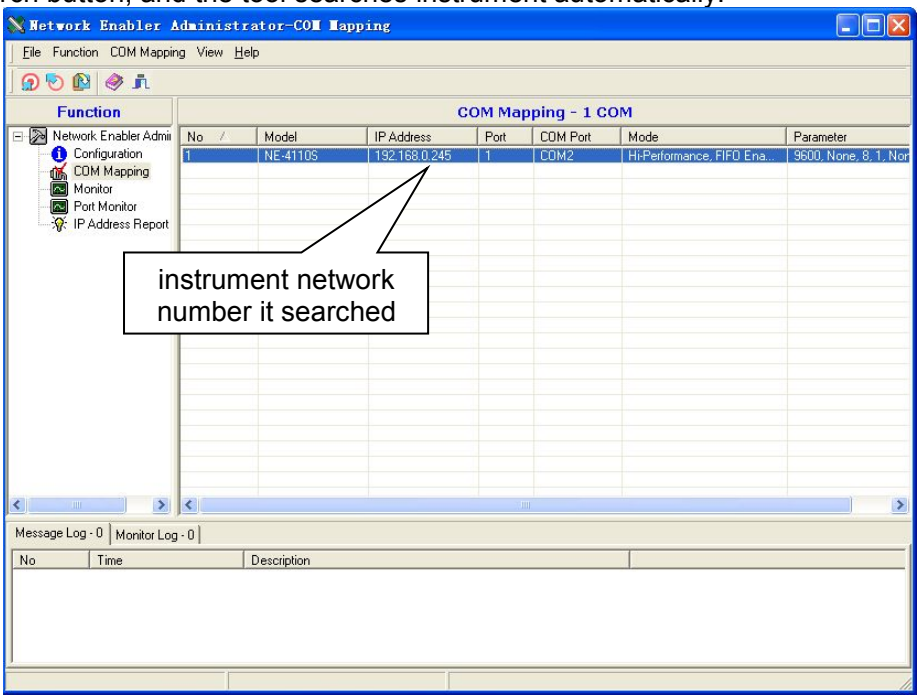


2.2.2 Run Network Enabler Administrator

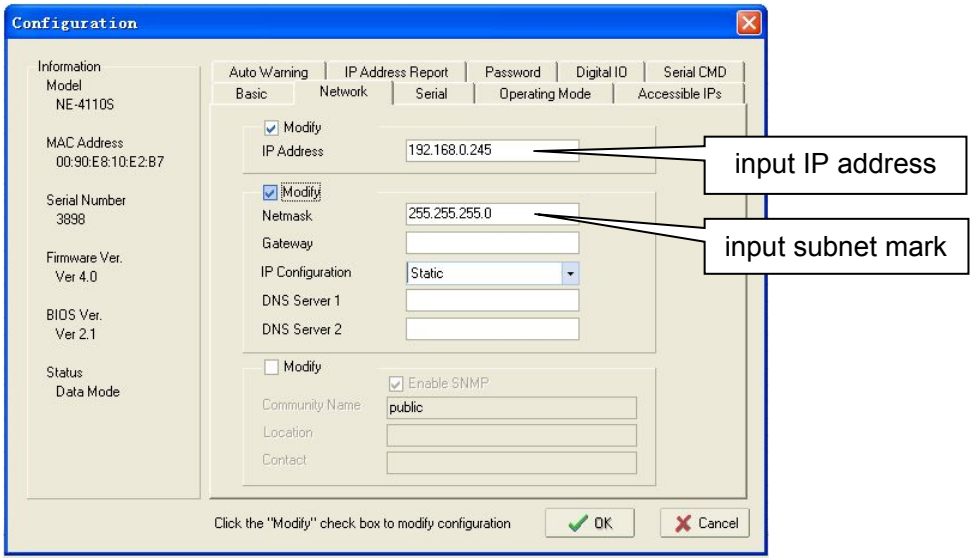


2.2.3 Configuration

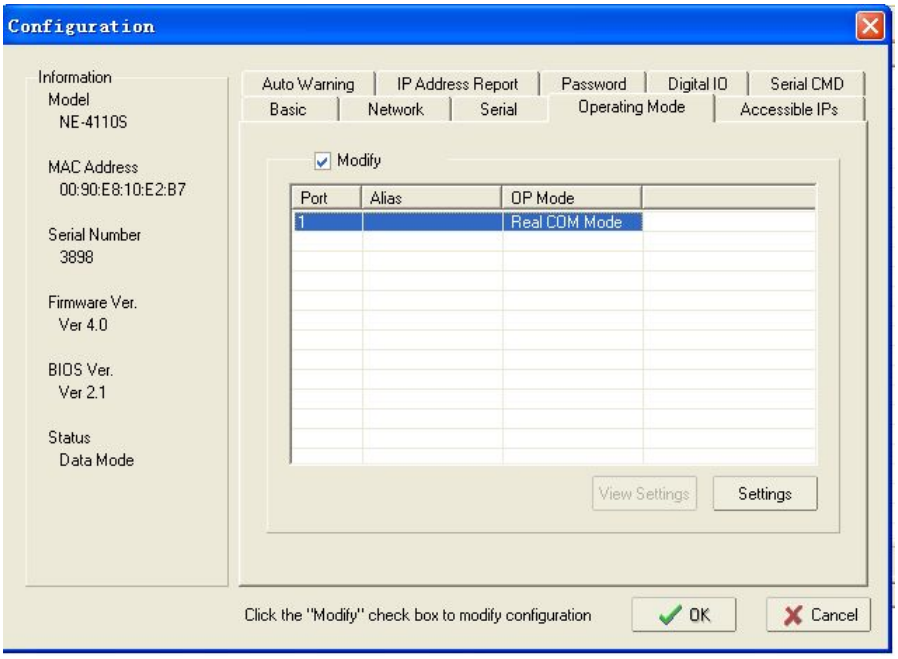
Click the search button, and the tool searches instrument automatically.



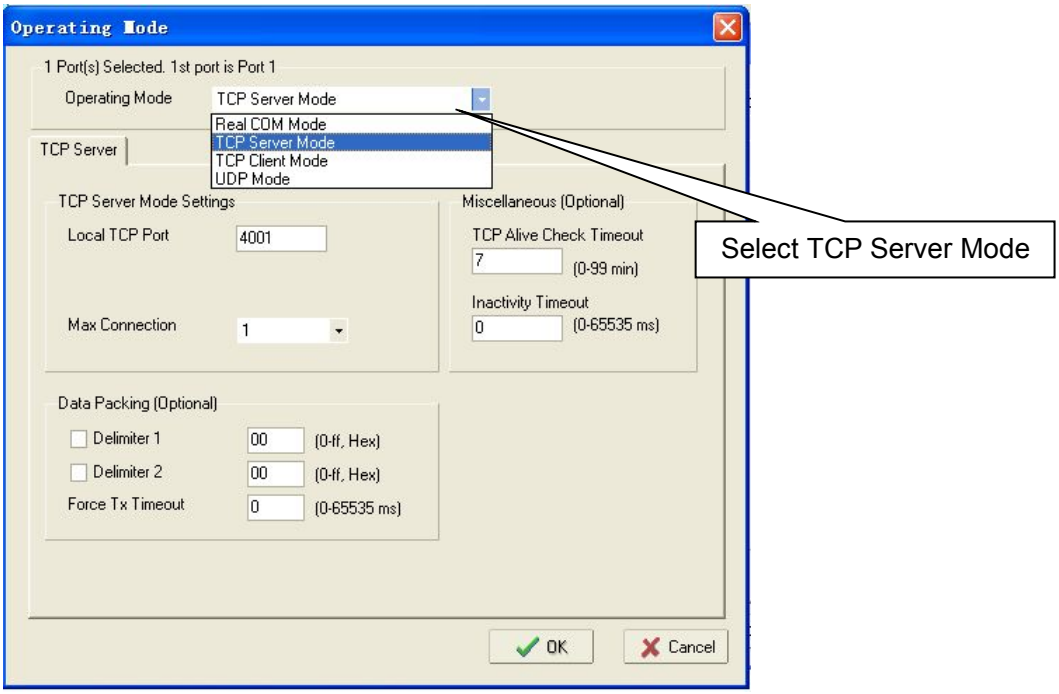
Double click the network number in the list column that it searched, open the property page and select network items.



Open the property page, select the Operating Mode items, click the settings button.

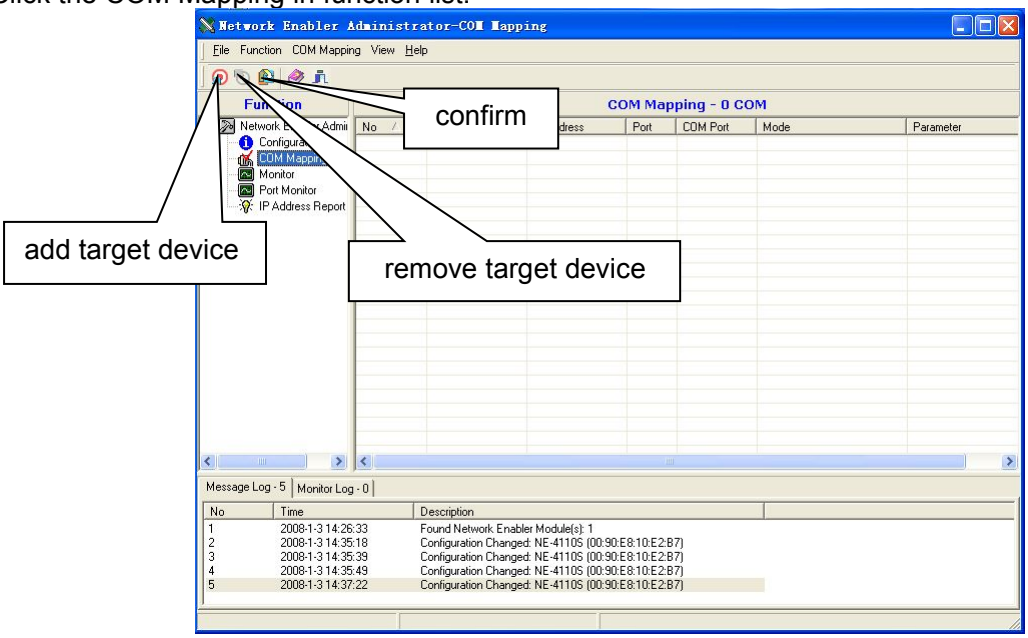


Select TCP Server Mode under Operating Mode.

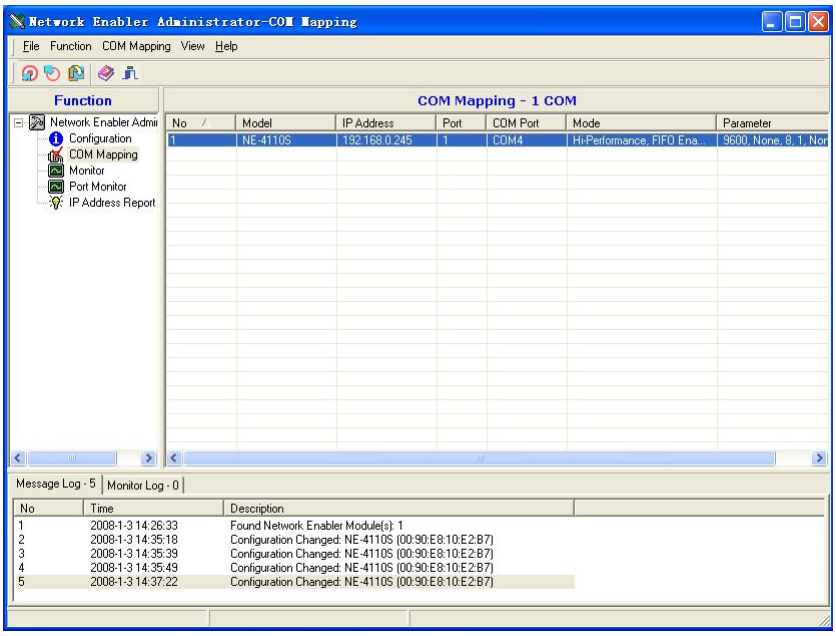


Click OK to complete IP address setting.

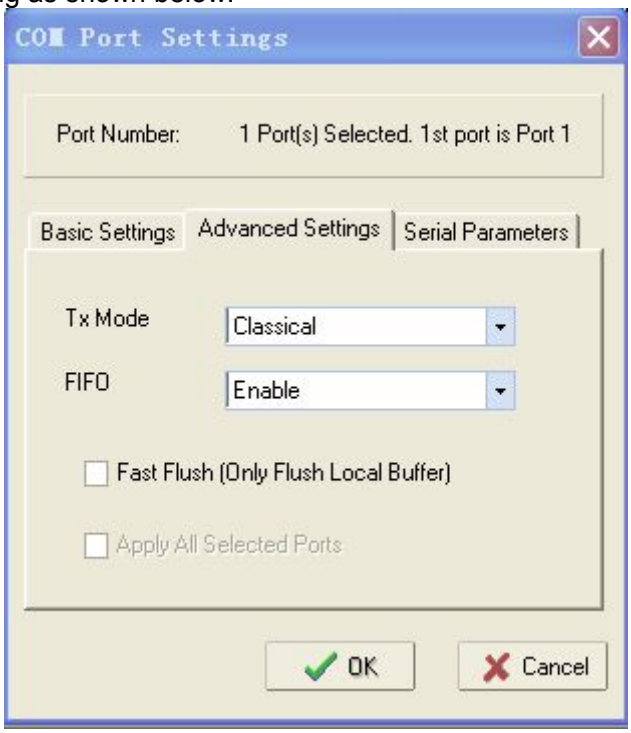
Click the COM Mapping in function list.



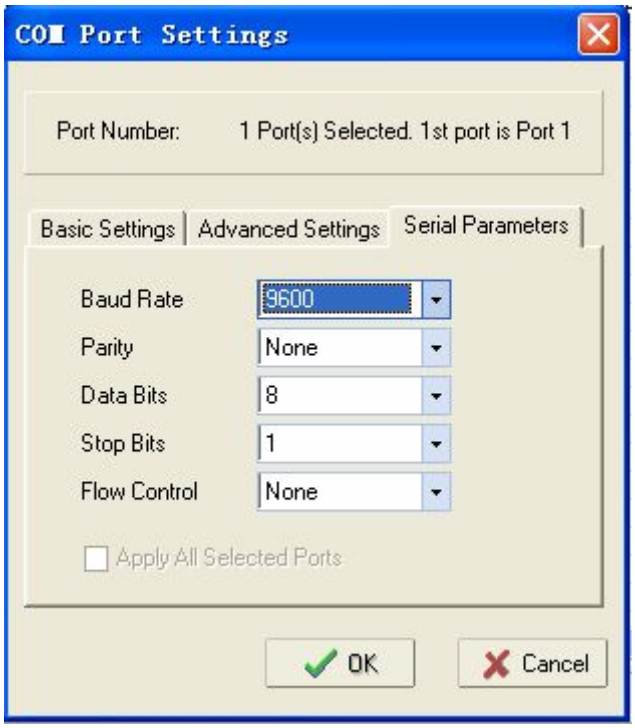
Click the "add target device" button to add target device.


Network Enabler Administrator-COM Mapping
File Function COM Mapping View Help
Function
COM Mapping - 1 COM
Network Enabler Admi
Configuration
COM Mapping
Monitor
Port Monitor
IP Address Report
No / Model IP Address Port COM Port Mode Parameter
1 NE-4110S 192.168.0.245 1 COM4 Hi-Performance, FIFO Ena... 9600, None, 8, 1, Non
Message Log - 5
Monitor Log - 0
No Time Description
1 2008-1-3 14:26:33 Found Network Enabler Module(s): 1
2 2008-1-3 14:35:18 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
3 2008-1-3 14:35:39 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
4 2008-1-3 14:35:49 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
5 2008-1-3 14:37:22 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)

Double click the network number setting property mapping page it searched in list column, and select Advanced Settings, setting as shown below.



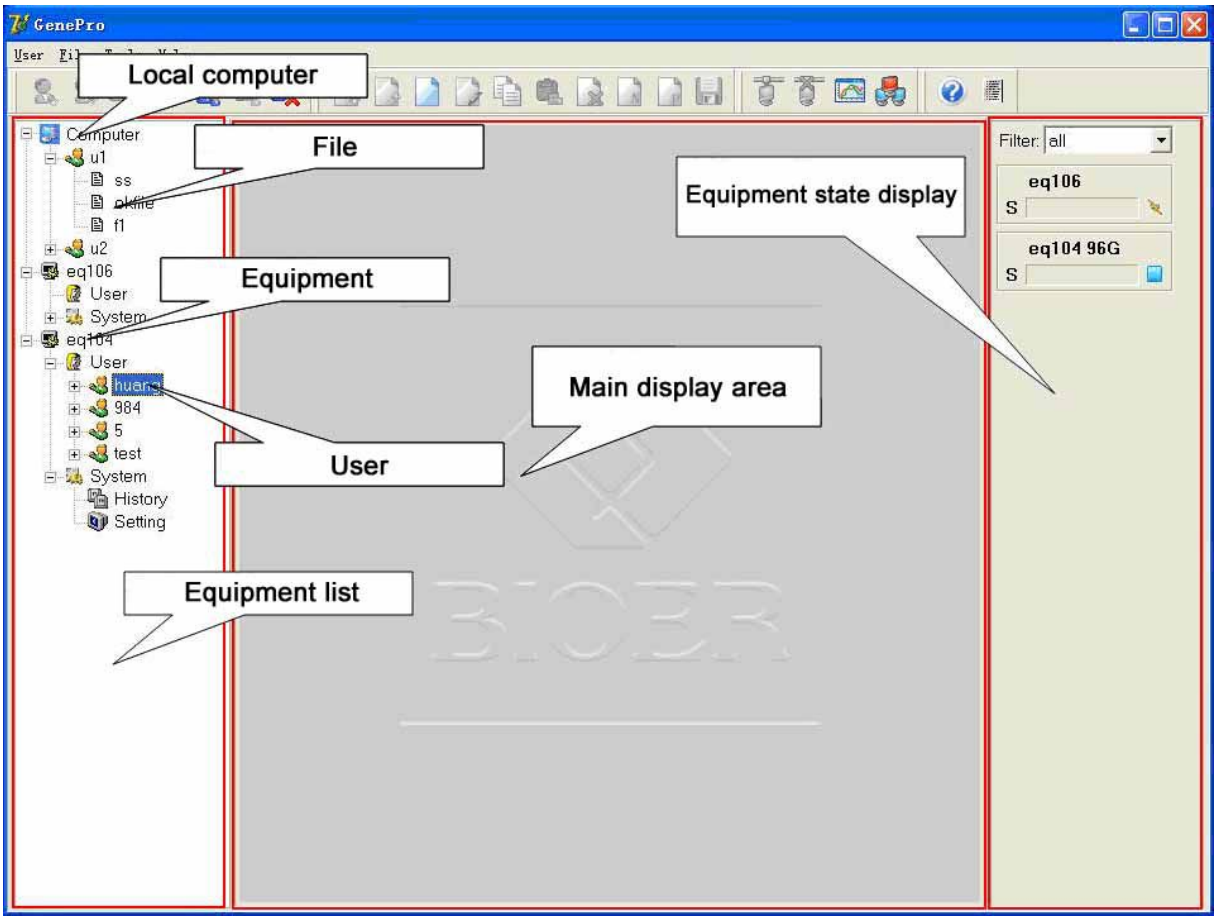
Select Serial Parameters, setting as shown below.



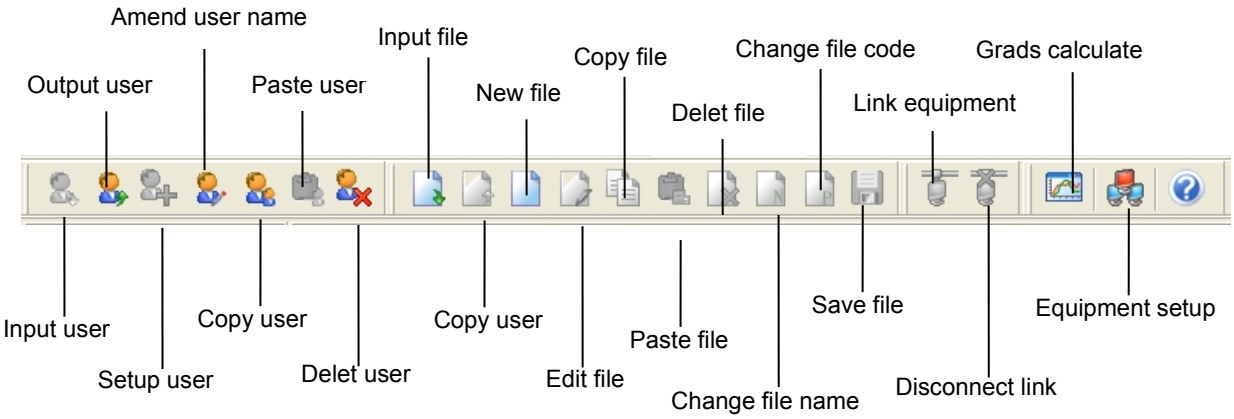
Click OK, click "confirmation", apply the setting, finally click "remove device" and complete mapping setting.

Caution:	1. Several devices online can't use a same IP address. 2. Configure the device again if this instrument is used for the first time. 3. Set same subnet for several devices online. 4. The device doesn't support the function of acquiring IP address automatically. 5. Use switch to connect for several devices online, use cross network cable to connect if HUB is used.

3. Main interface



3.1 Tool bar



3.2 Basic operation

Run a file

- Open device or this computer's file.
- Click "run".
- Select type and volume for test tube.
- Click "OK" to run.

Prompt

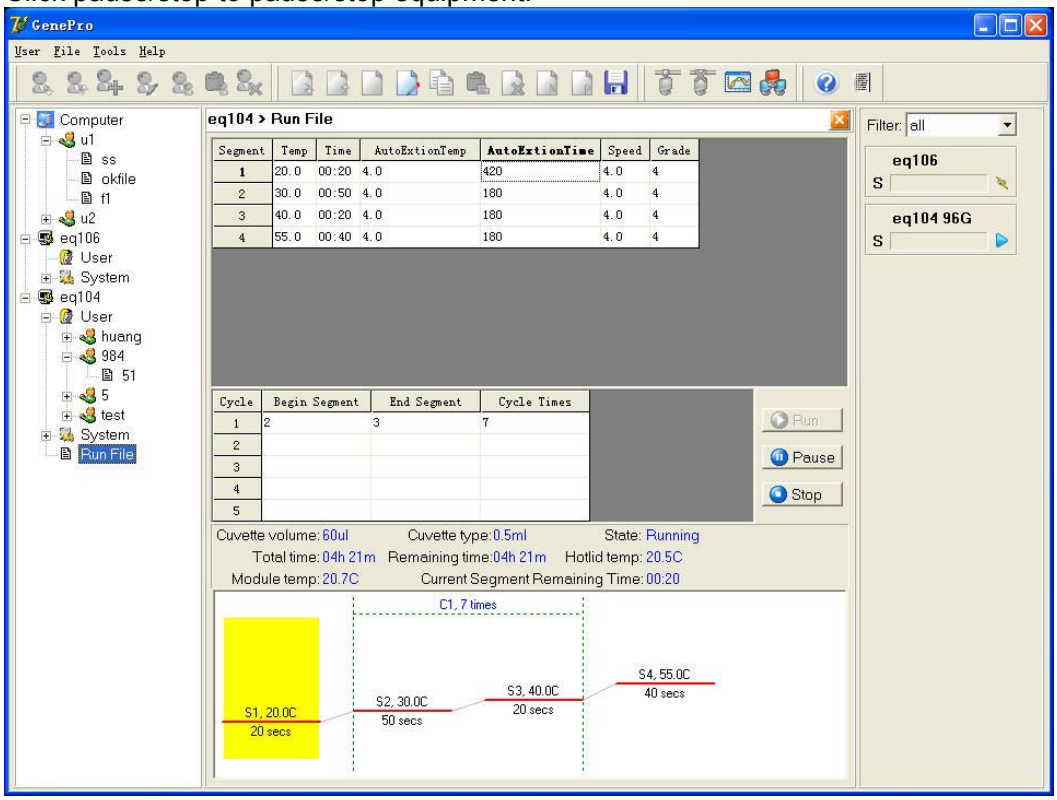
Select device before running if file is saved in computer.

View running file

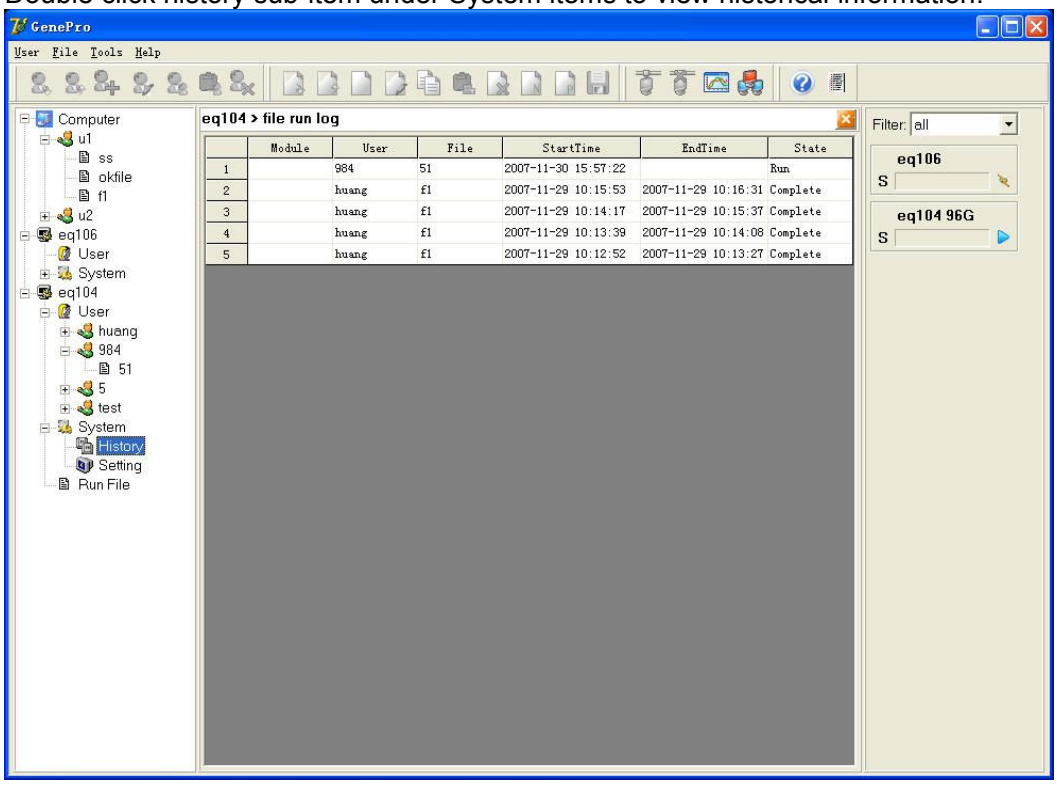
- Run File (A/B) is shown below the device name when device is running file.
- Double click Run File (A/B) to see running file contents and device running status.

Prompt

Click pause/stop to pause/stop equipment.

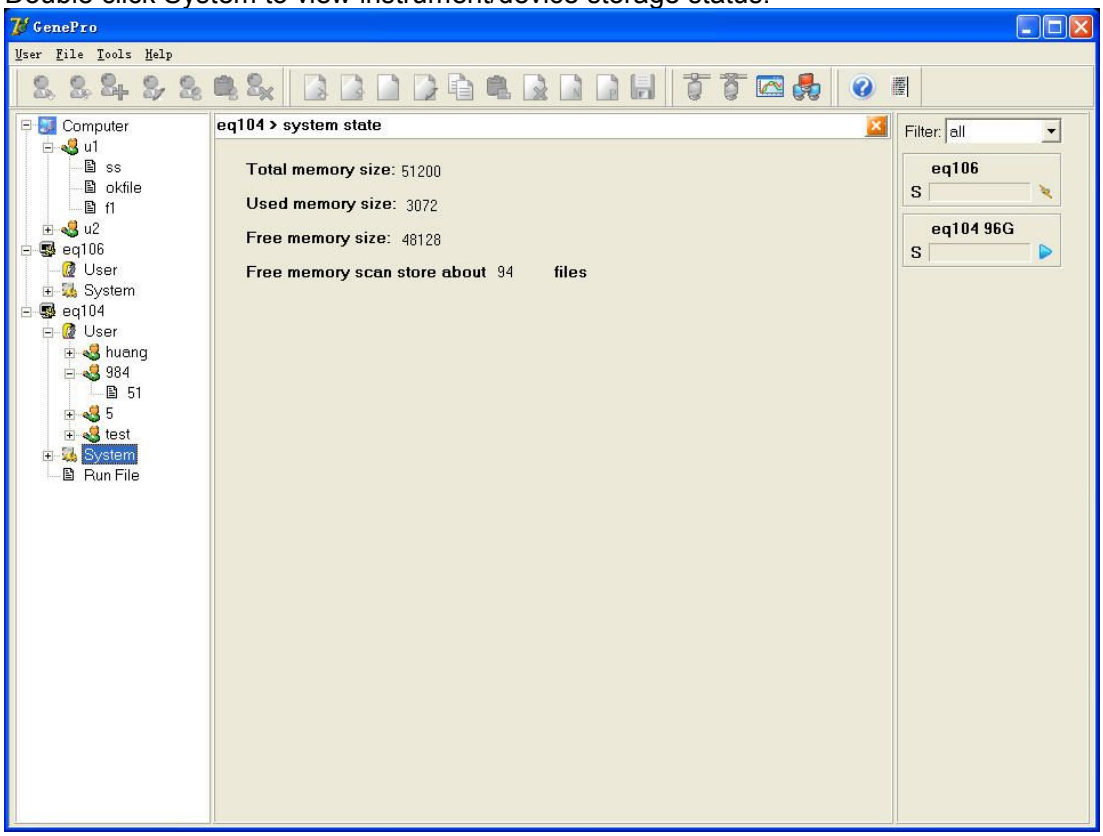


Double click history sub-item under System items to view historical information.



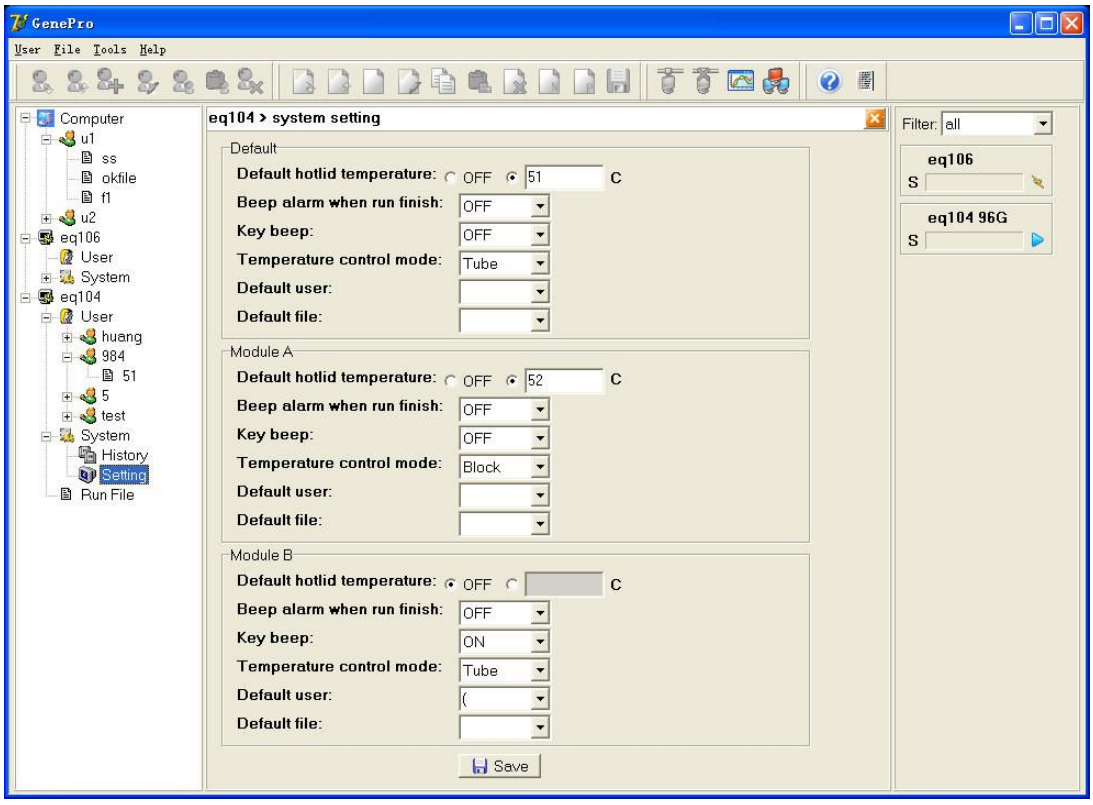
View instrument/device storage status

Double click System to view instrument/device storage status.



Set system parameters

Double click Settings sub-item under System items to set system parameters.



3.3 User menu

How to…

Create new file
Change user name
Copy user
Paste user
Delete user
Import user
Export user

Create a user

- Select device name sub-item in device list or any user name sub-item in device name sub-item.
- Select "create user" menu under User menu, it bounces a user dialog box.
- Input user name and click OK.

Create User
Do you want to create new user in 'Computer' ?
Enter new user name:
(The user name can contain only letters and numbers)
OK
Cancel

Change user name

- Select "Change user name".
- Select "Change User Name" menu under User menu, it bounces the dialog box to change user name.
- Input user name and click OK.

Prompt

User name can't be changed if the file under user name is open.

Change User Name
Do you want to change user name of 'Computer's 123' ?
Enter new user name:
(The user name can contain only letters and numbers)
OK
Cancel

Copy user

- Select user name to be copied by device list.
- Select Copy User menu under User menu.

Paste user

- Select User sub-item in device list or device item in device list.
- Select Paste User menu under User menu.

Prompt

- User can't be pasted if copy user is already existed and file is open.
- Paste is only done between local computer and device.

Delete user

- 1 Select user to be deleted by device list.
- 2 Select delete User menu under User menu.

Prompt

User can't be deleted if file under user is open.

Import user

- Select local computer.
- Select Import User menu under User menu.
- Select the directory for import, click Open.

Prompt

User can't be imported if user to be imported is already existed and user file is open.

Export user

- Select user to be exported by local computer.
- Select Export User menu under User menu.
- Select the directory for export, click OK.

Prompt

User can't be exported if user file to be exported is open.

3.4 File menu

How to…

Create new file
Open and edit file
Copy file
Paste file
Delete file
Change file name
Change file password
Save file
Import file
Export file

Create new file

- Select user to create file.

- Select Create New File menu under File menu to bounce dialog box.
- 3 Input file name and password, click OK.

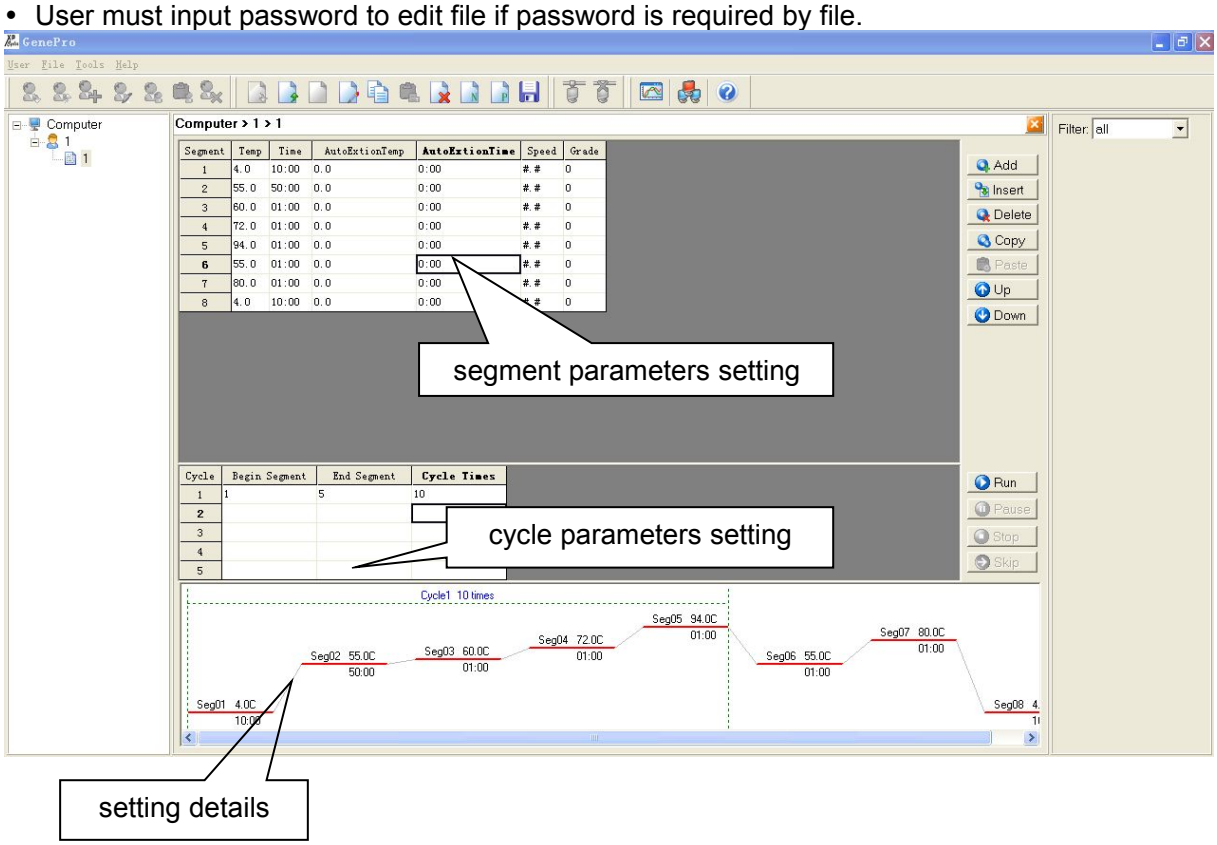
Create File
Do you want to create new file in '1' of 'Computer' ?
Enter new file name:
(The file name can contain only letters and numbers)
Enter password:
(The password can contain only numbers)
Enter password again:
Use empty password.
OK
Cancel

Edit file

- Double click user sub-item in device list, open file list, double click edit file or create new file, access the interface to edit file.
- Edit file contents, click Save to save file.

Prompt

- All steps can be viewed from graphs.
- User must input password to edit file if password is required by file.



Copy file

- Select the file to be copied.
- Select Copy File menu under File menu.

Paste file

- Select User item under device list.
- File can't be overlaid if it is already existed and open.

Prompt

- File is only copied and pasted between computer and device.
- File can't be overlaid if it is already existed and open.

Delete file

- Select file to be deleted.
- Select Delete File menu under File menu.

Prompt

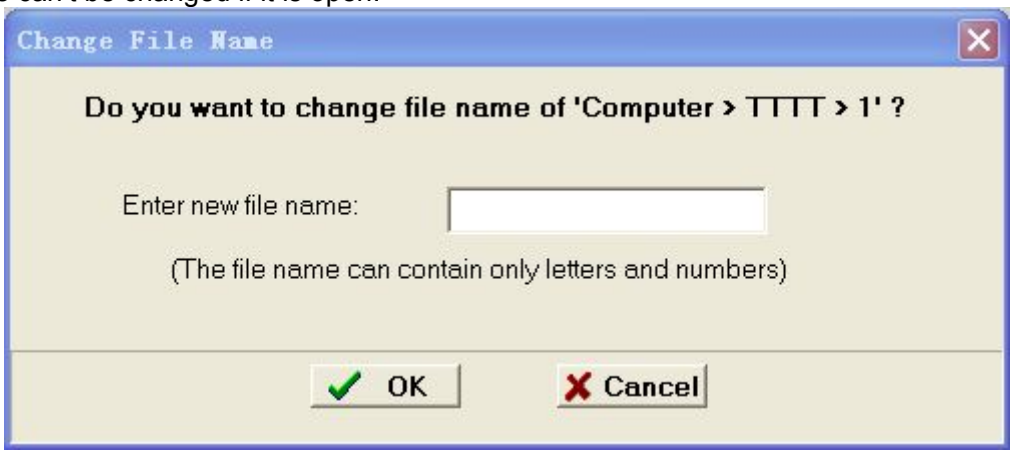
File can't be deleted if it is open.

Change file name

- Select file to change name.
- Select Change File Name menu under File menu.
- Input file name and click OK.

Prompt

File name can't be changed if it is open.


Change File Name
Do you want to change file name of 'Computer > TTTT > 1' ?
Enter new file name:
(The file name can contain only letters and numbers)
OK
Cancel

Change file password

- Select file to change password.
- Select Change File Password menu under File menu to bounce dialog box.
- Input old password and new password, click OK.

Prompt

File name can't be changed if it is open.

Change File Password
Do you want to change password of 'Computer > TTTT > 1' ?
Enter old password:
Enter new password:
(The password can contain only numbers)
Enter new password again:
Use empty password.
OK
Cancel

Save file

After file is edited, click Save File item under File menu to save file.

Import file

- Select user item on local computer.
- Select Export File menu under File menu.
- Select file to import and click Open.

Prompt

File can't be imported if file is already existed and open.

Export file

- Select file to be exported.
- Select Export File menu under File menu.
- Select path for export and click OK.

Prompt

File can't be exported if it is open.

3.5 Tool menu

How to…

Connect device
Disconnect
Calculate gradient
Change device IP and device name

Connect device

Select device not connected, click **Connect** menu.

Prompt

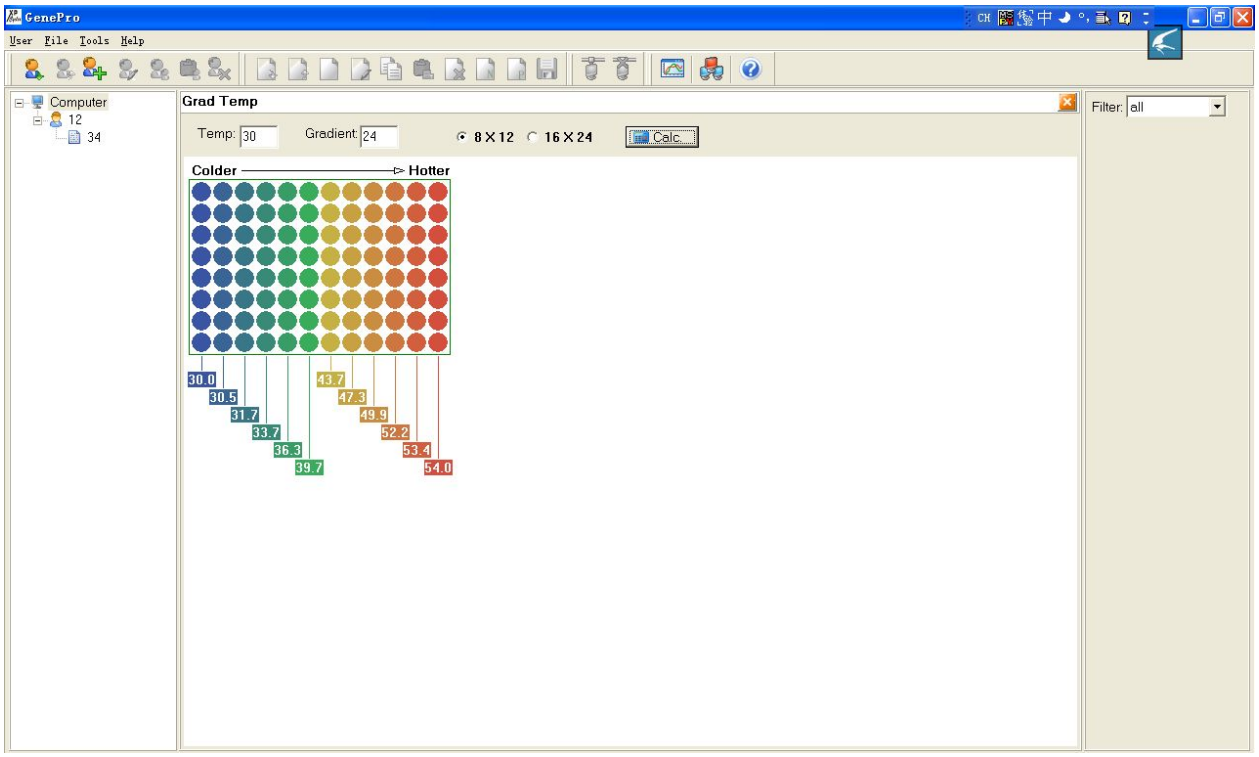
One device can only connect to one computer.

Disconnect

Select device not connected, click **Disconnect** menu.

Calculate gradient

- Select gradient menu.
- Input gradient initial point and gradient value.
- Select 8*12 (96 holes) as calculation module type.
- Click Calc.

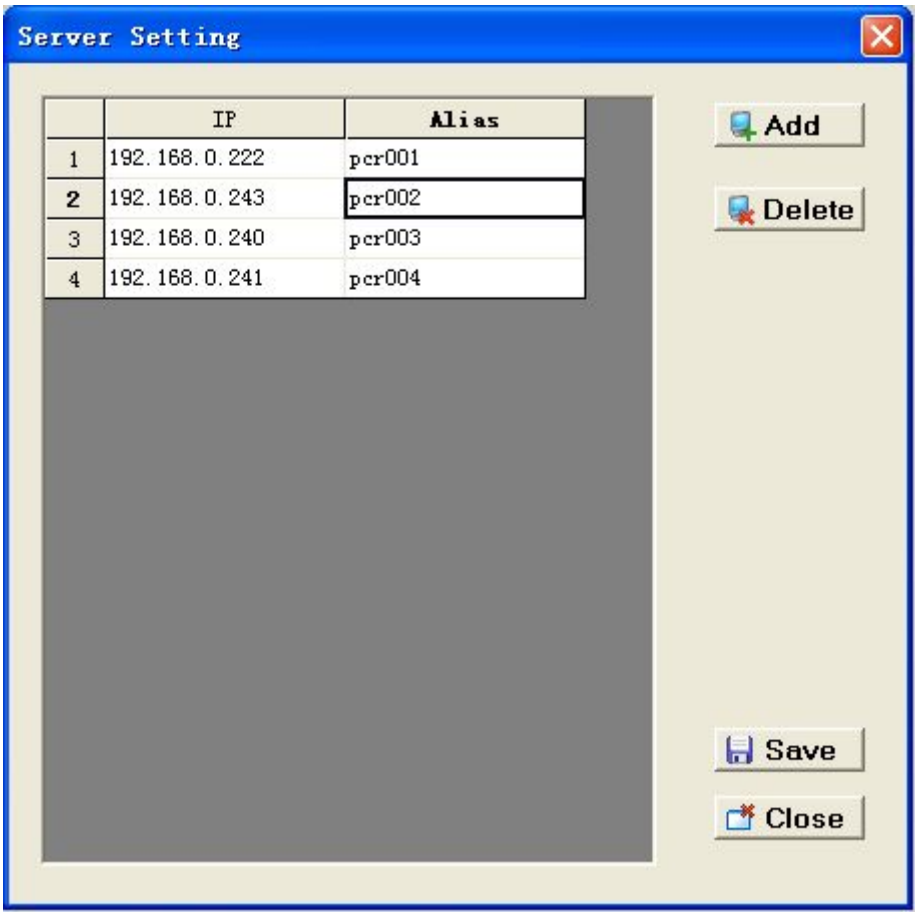


Change device IP and device name

- Select Server Setting item under Tool menu to bounce the dialog box for setting.
- Click Add to add line.
- Click Delete to delete current line.
- Fill in IP address and alias, click Save to save setting.

Prompt

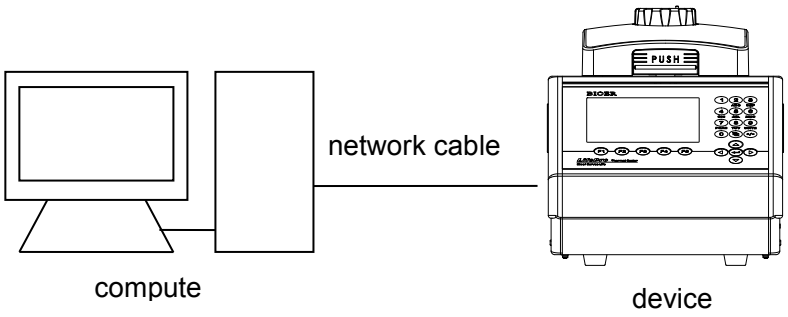
- The setting comes into valid only after software restart.
- IP setting must match the device.


Server Setting
IP
Alias
1
192.168.0.222
pcr001
2
192.168.0.243
pcr002
3
192.168.0.240
pcr003
4
192.168.0.241
pcr004
Add
Delete
Save
Close

Chapter VI Firmware upgrading

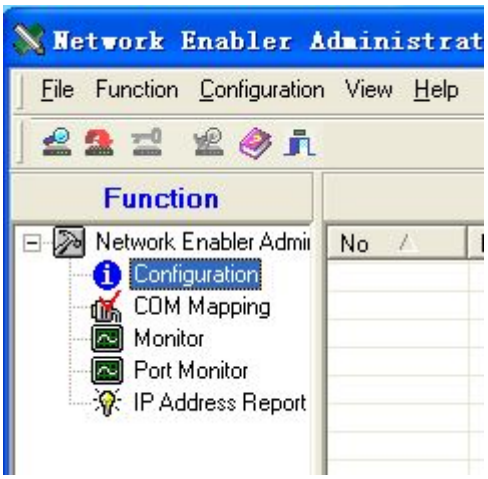
1. Device configuration

1) Connect device to computer by network cable (gray, cross~~, B type connection~~).

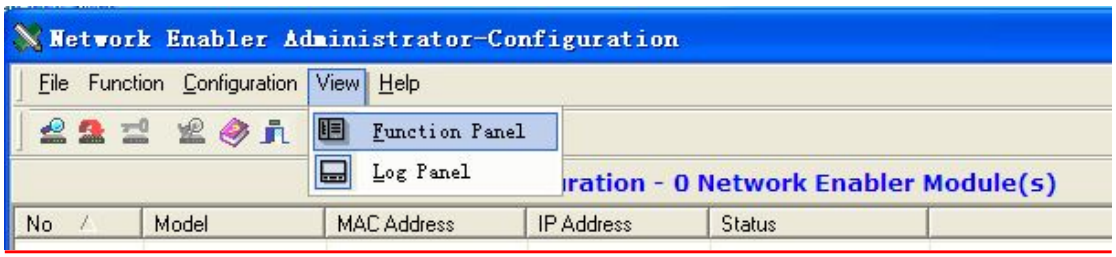


2) Run **Network Enable Administrator**

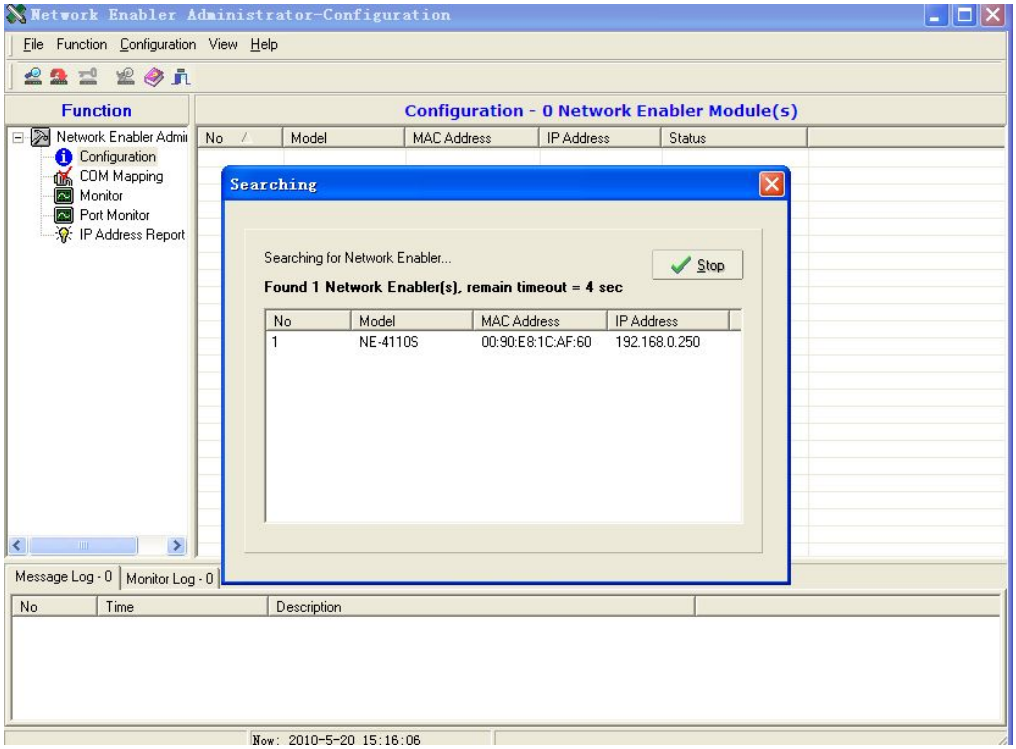
To affirm state of **configuration** in the column of **Function**



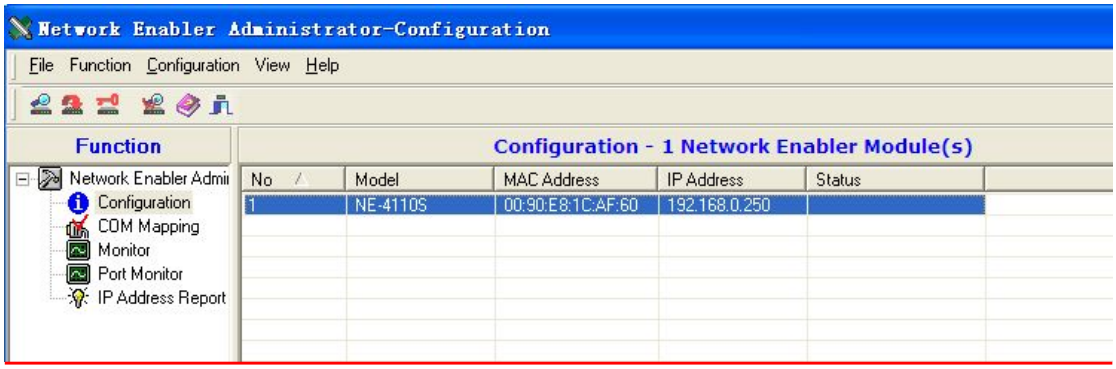
Caution: *If there is no the column of* ***Function****, please select* ***View->Function Panel****, then display the column of* ***Function****, and user may affirm the above.*



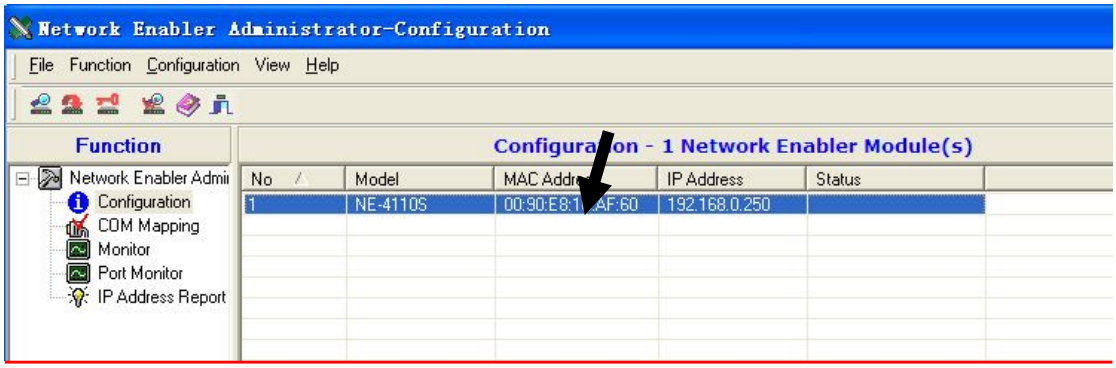
To select search button by using mouse, then appear the following interface

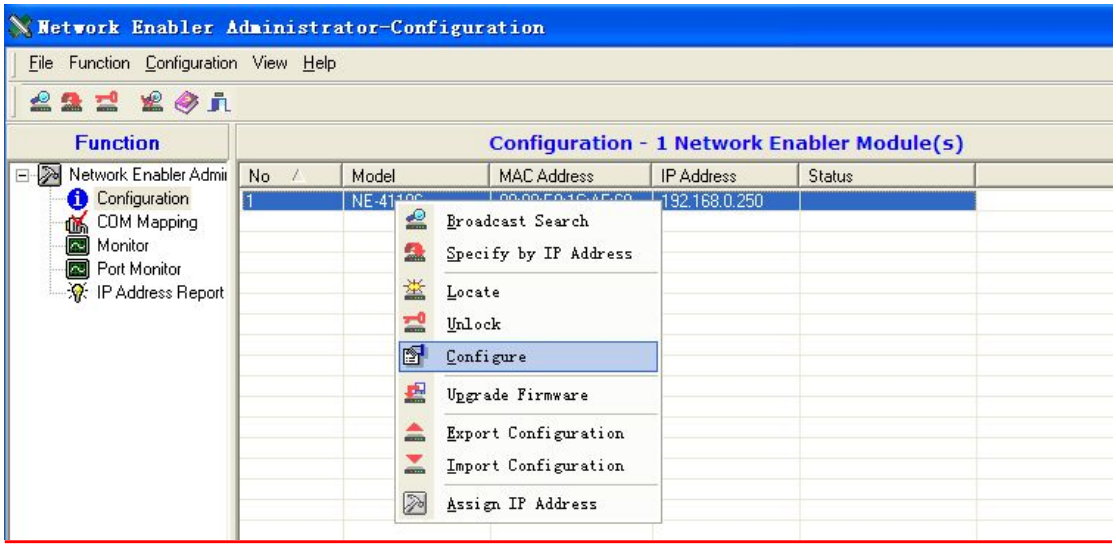


After connecting device normally, the following interface will appear

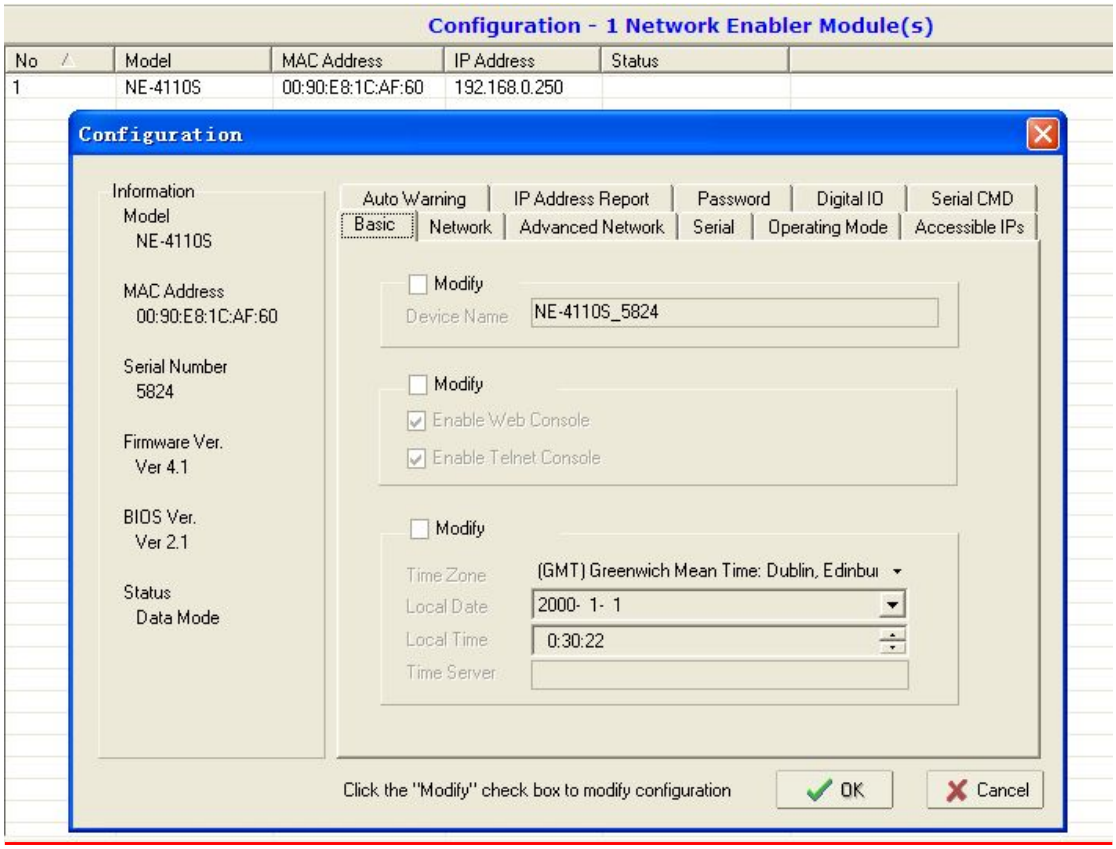


To double click the entry of the following graphic by using mouse, or pitch on the entry, then select Configure from menu of right button

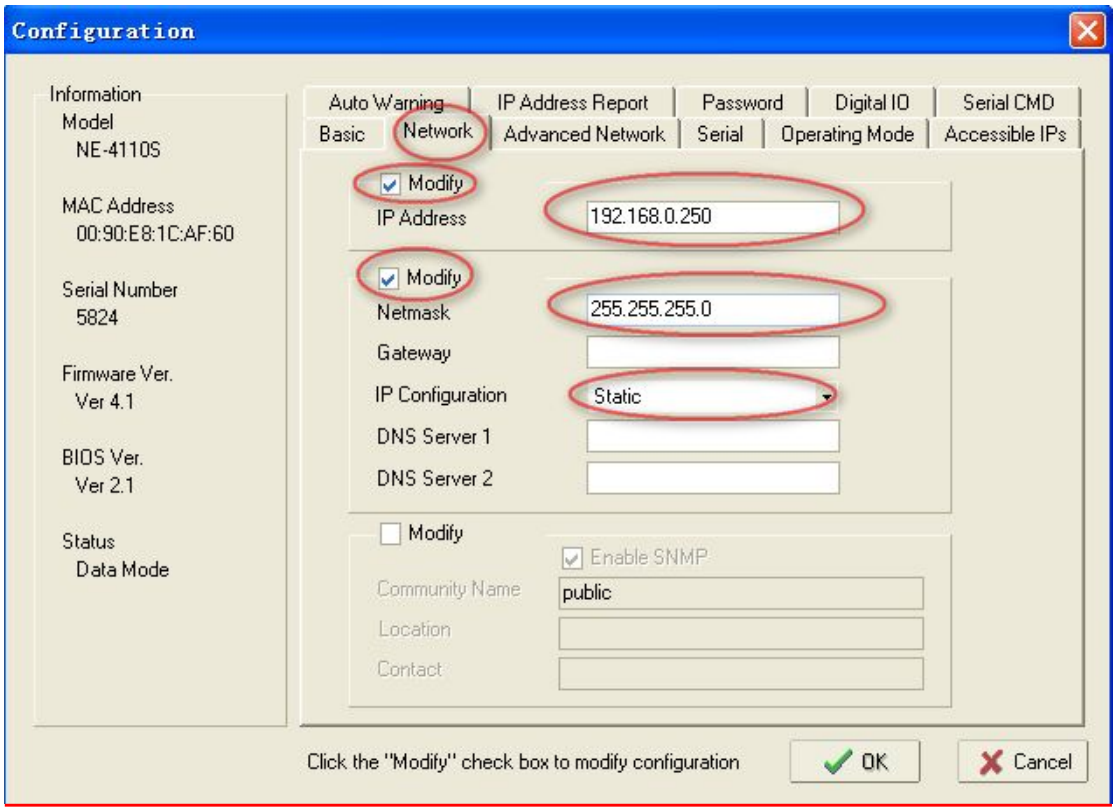




Then appear the following setup window

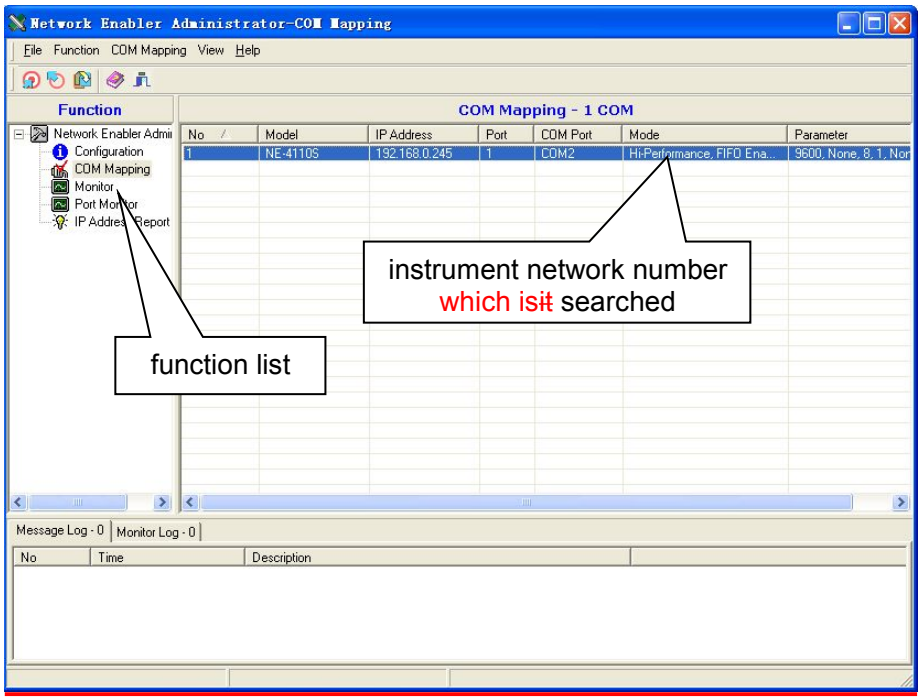


To click **Network**, the following interface will appear

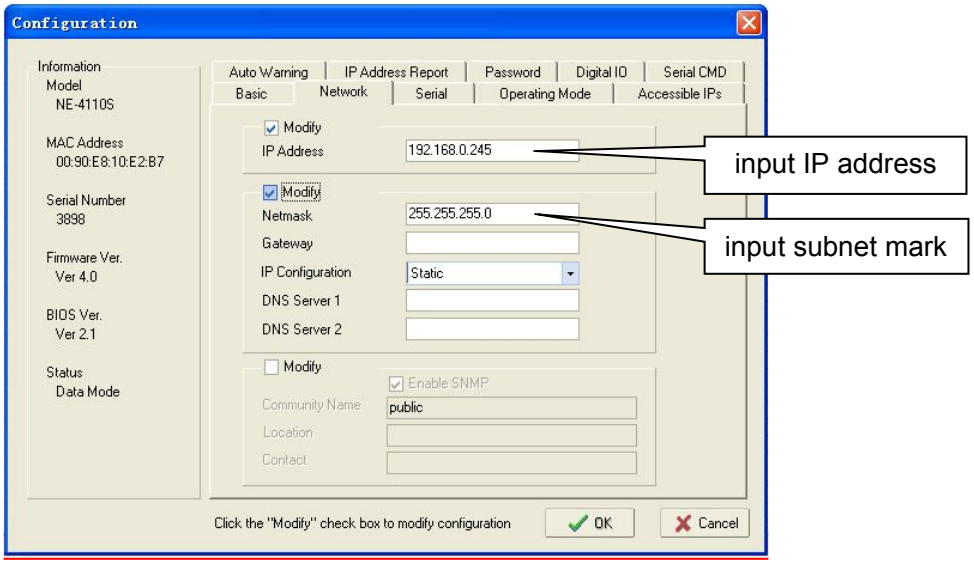


3) Configuration

To click search button, software will search device automatically.

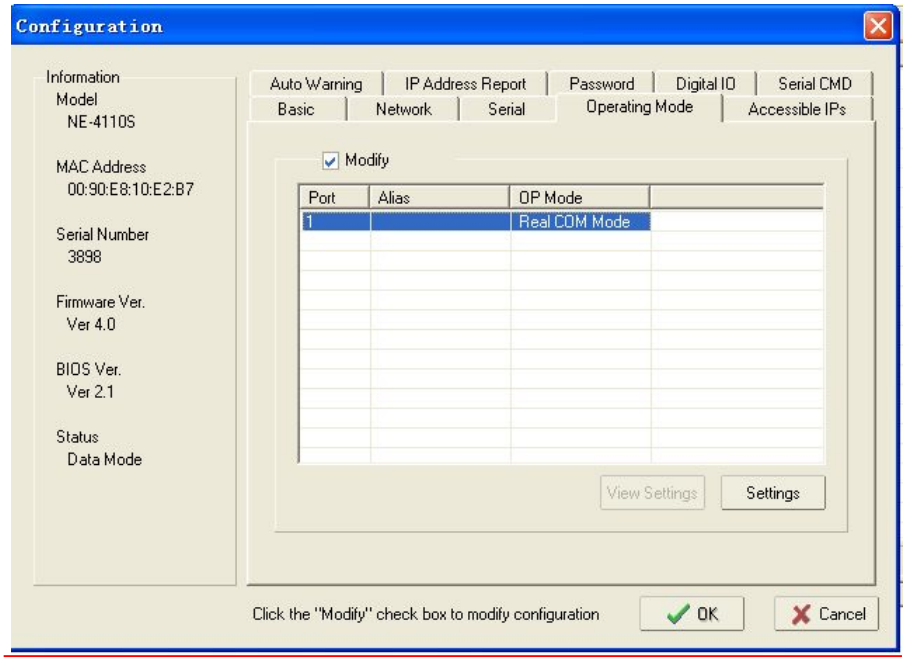


Double click the network number in the list column which is searched, open the property page and select network items.

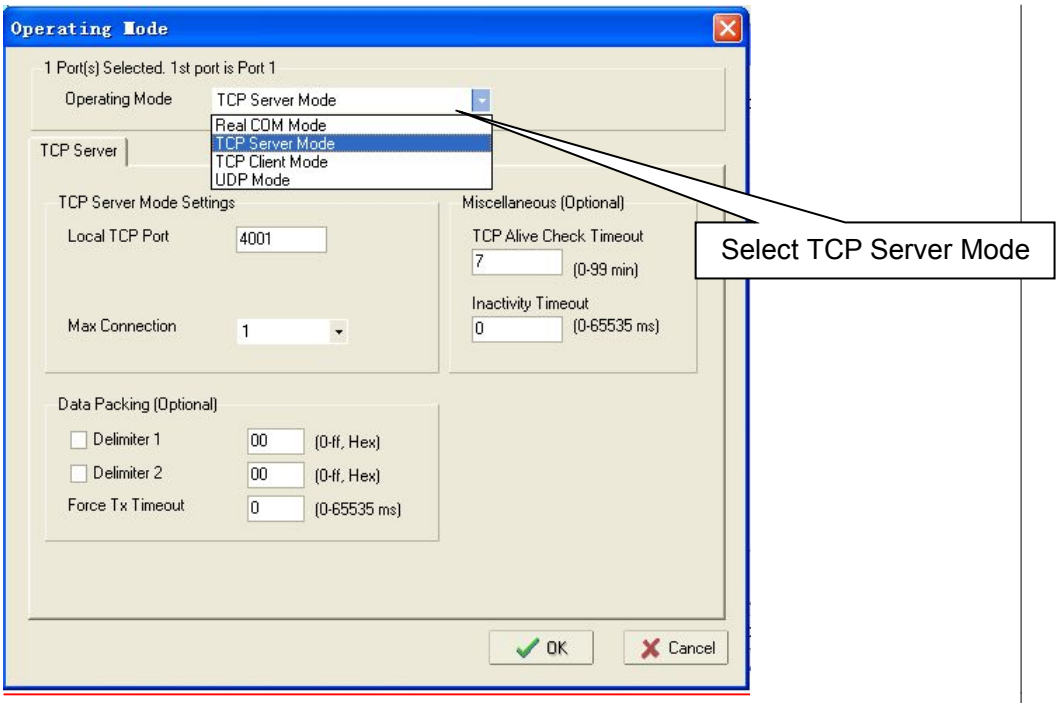


Causion: Ip address and subnet mark are set according to network requirement of computer.

Open the property page, select the Operating Mode item, then click the settings button.



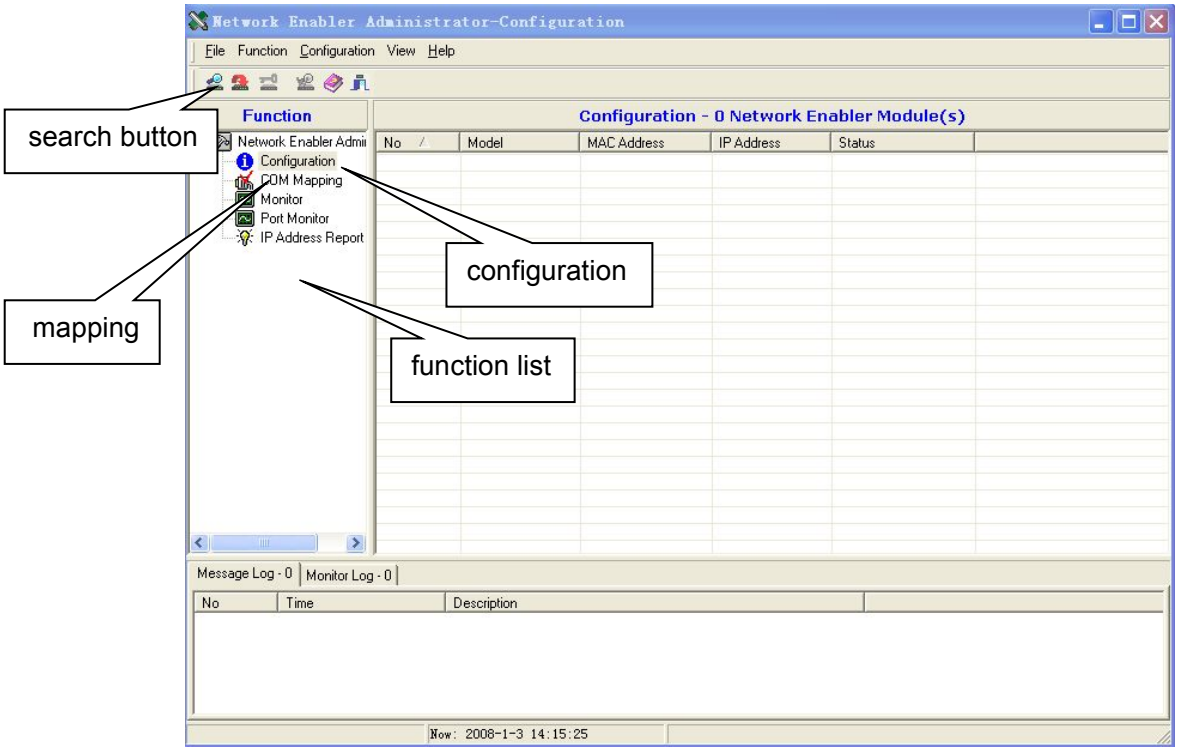
Select TCP Server Mode under Operating Mode.



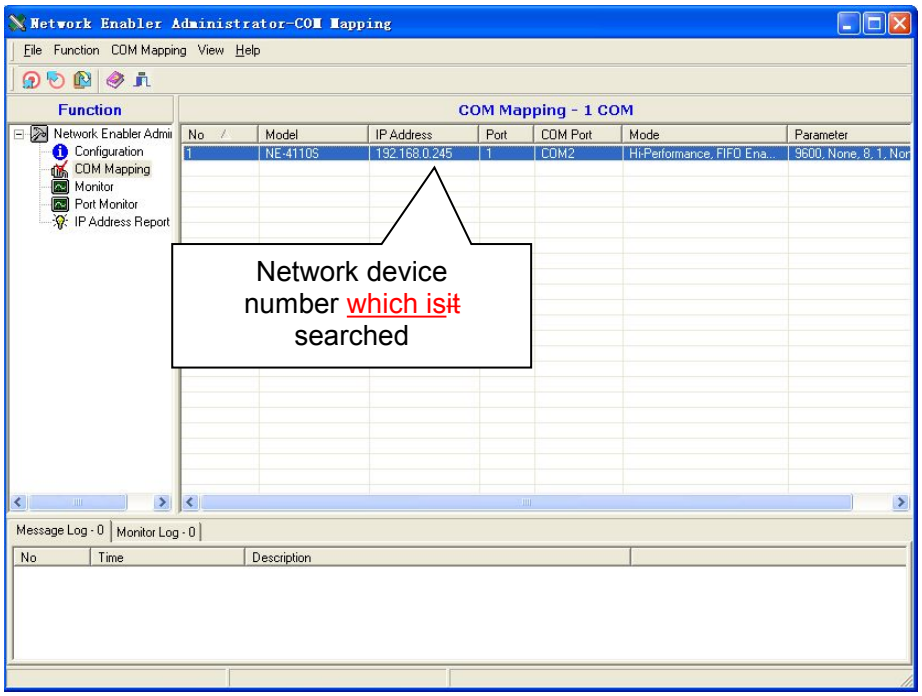
Click OK to complete IP address setting.
Caution: To select TCP Server Mode is not to upgrade but to connect.

2. Way to upgrade instrument software

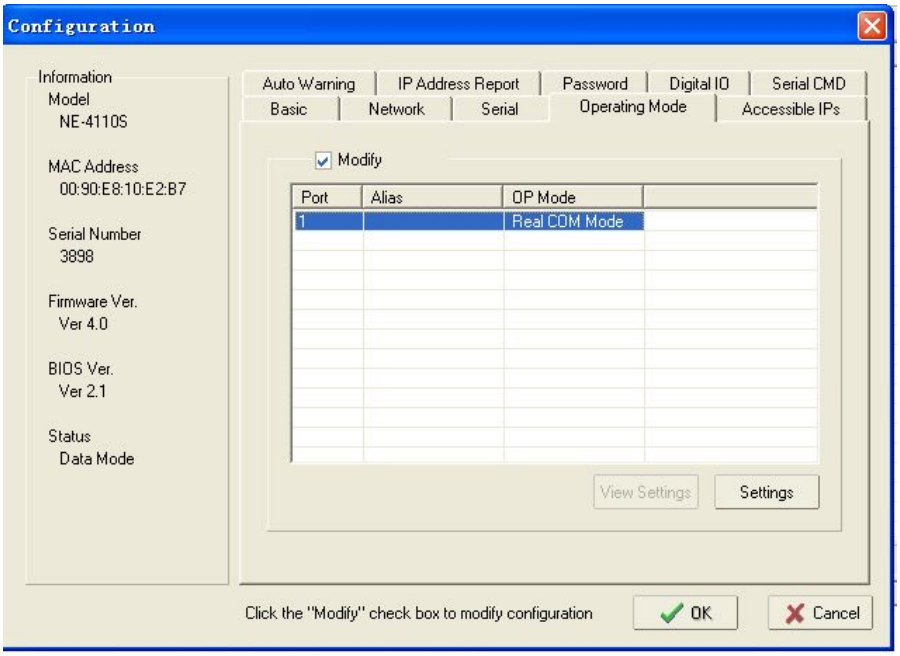
1) Press F1 on instrument and p~~P~~ower on, open instrument, ~~press F1 on instrument~~ to access software upgrading preparation status and find “Prepare to upgrade…” on screen.
2) Run **Network Enabler Administrator** program. It communicates through virtual device mapping while instrument upgrading.



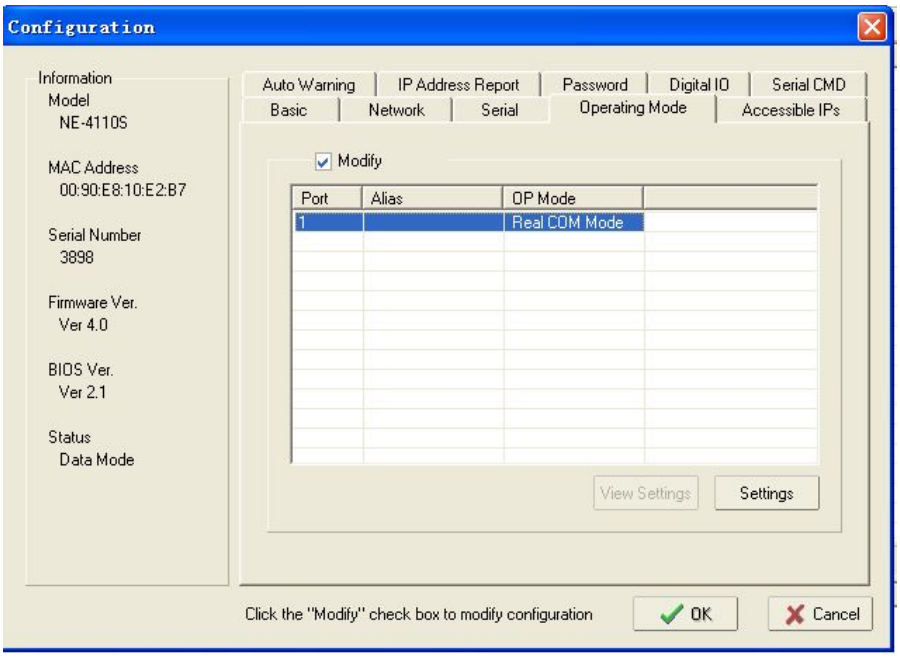
3) Configuration
Click search button, software~~the too~~l searches device automatically.



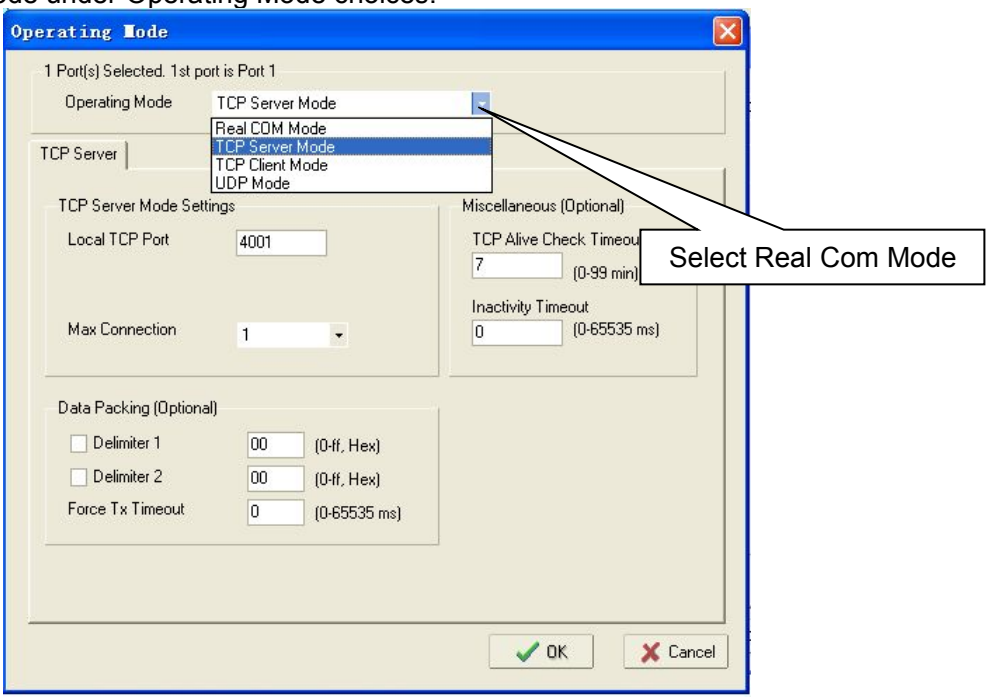
Double click the network number searched on list column, open the property page, and select network.



Open the property page, select Operating Mode, and click settings.

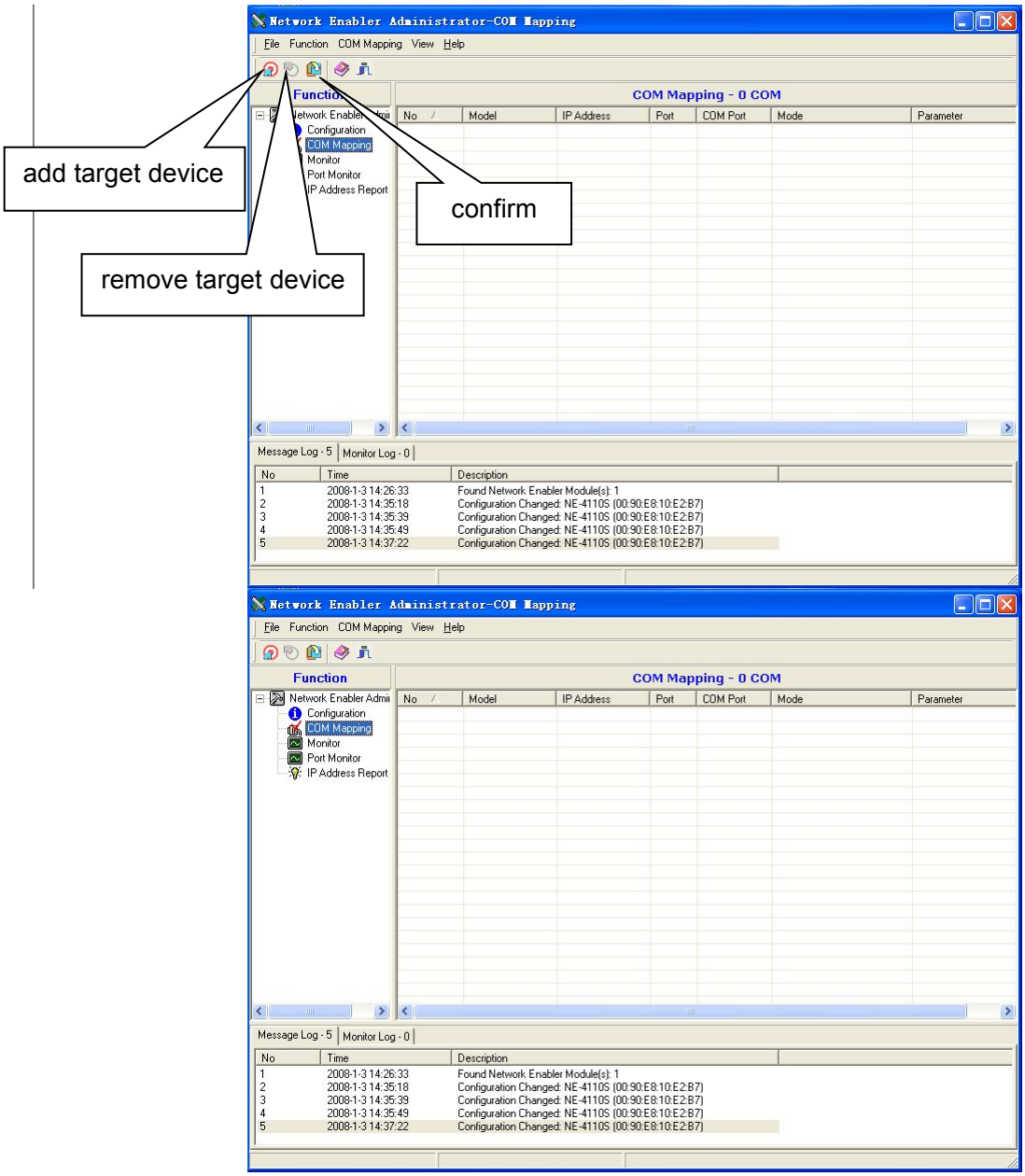


Select Real com Mode under Operating Mode choices.

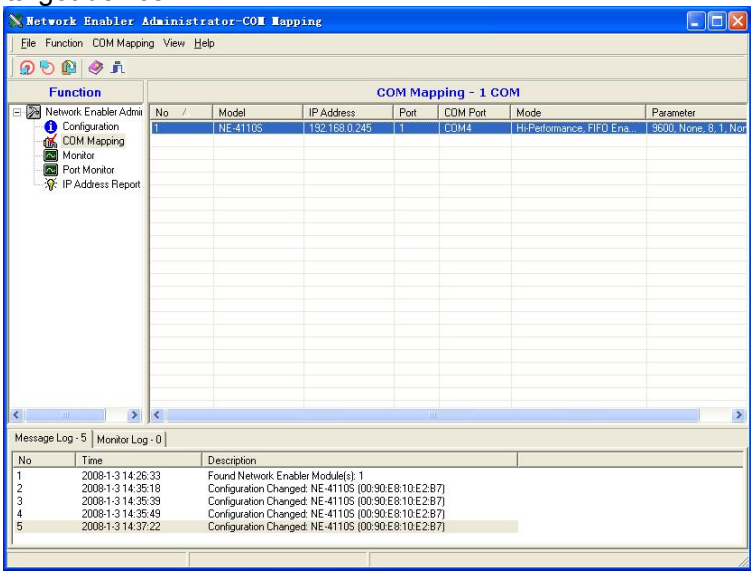


Caution: To select Real Com Mode is not to connect but to upgrade.

Click COM MAPPING in function list.

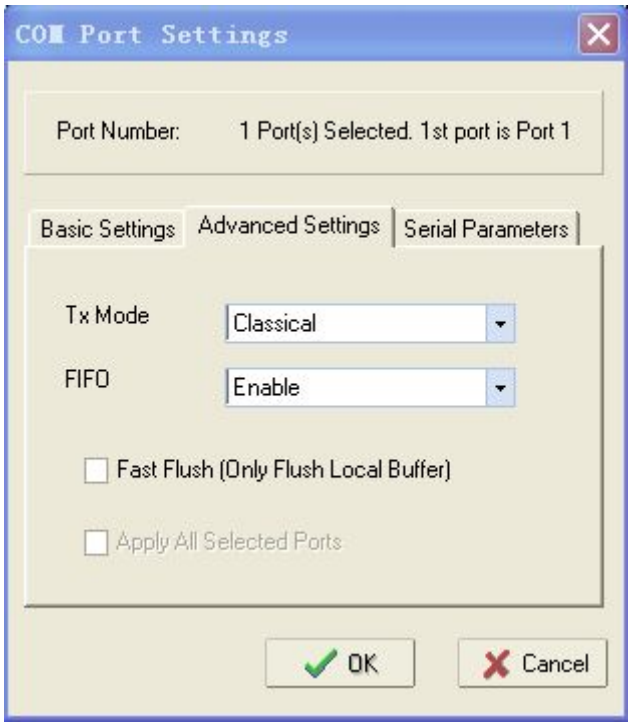

add target device
remove target device
confirm
Network Enabler Administrator-COM Mapping
File Function COM Mapping View Help
Function
COM Mapping - 0 COM
Configuration
COM Mapping
Monitor
Port Monitor
IP Address Report
No Model IP Address Port COM Port Mode Parameter
Message Log - 5
Monitor Log - 0
No Time Description
1 2008-1-3 14:26:33 Found Network Enabler Module(s): 1
2 2008-1-3 14:35:18 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
3 2008-1-3 14:35:39 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
4 2008-1-3 14:35:49 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
5 2008-1-3 14:37:22 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)

Click button for add target device.

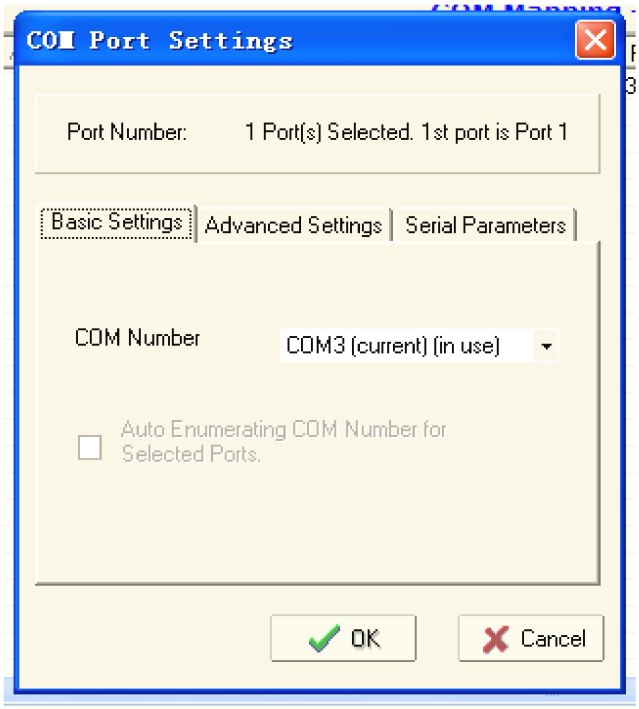

Network Enabler Administrator-COM Mapping
File Function COM Mapping View Help
Function
COM Mapping - 1 COM
Configuration
COM Mapping
Monitor
Port Monitor
IP Address Report
No Model IP Address Port COM Port Mode Parameter
1 NE-4110S 192.168.0.245 1 COM4 Hi-Performance, FIFO Ena... 9600, None, 8, 1, Non
Message Log - 5
Monitor Log - 0
No Time Description
1 2008-1-3 14:26:33 Found Network Enabler Module(s): 1
2 2008-1-3 14:35:18 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
3 2008-1-3 14:35:39 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
4 2008-1-3 14:35:49 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)
5 2008-1-3 14:37:22 Configuration Changed: NE-4110S (00:90:E8:10:E2:B7)

Double click ~~network number~~ setting mapping property page of network number searched in list column, and select Advanced Settings, setting as the followings~~hown below~~.

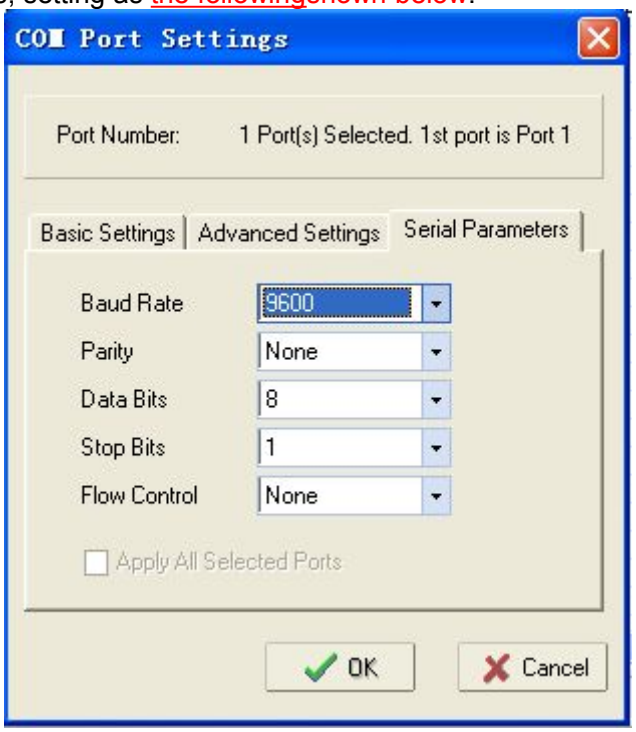
Caution:



Select Basic Settings, setting as the following.



Select Serial Parameters, setting as the followingshown below.



Click OK, click confirmation, and apply the setting.

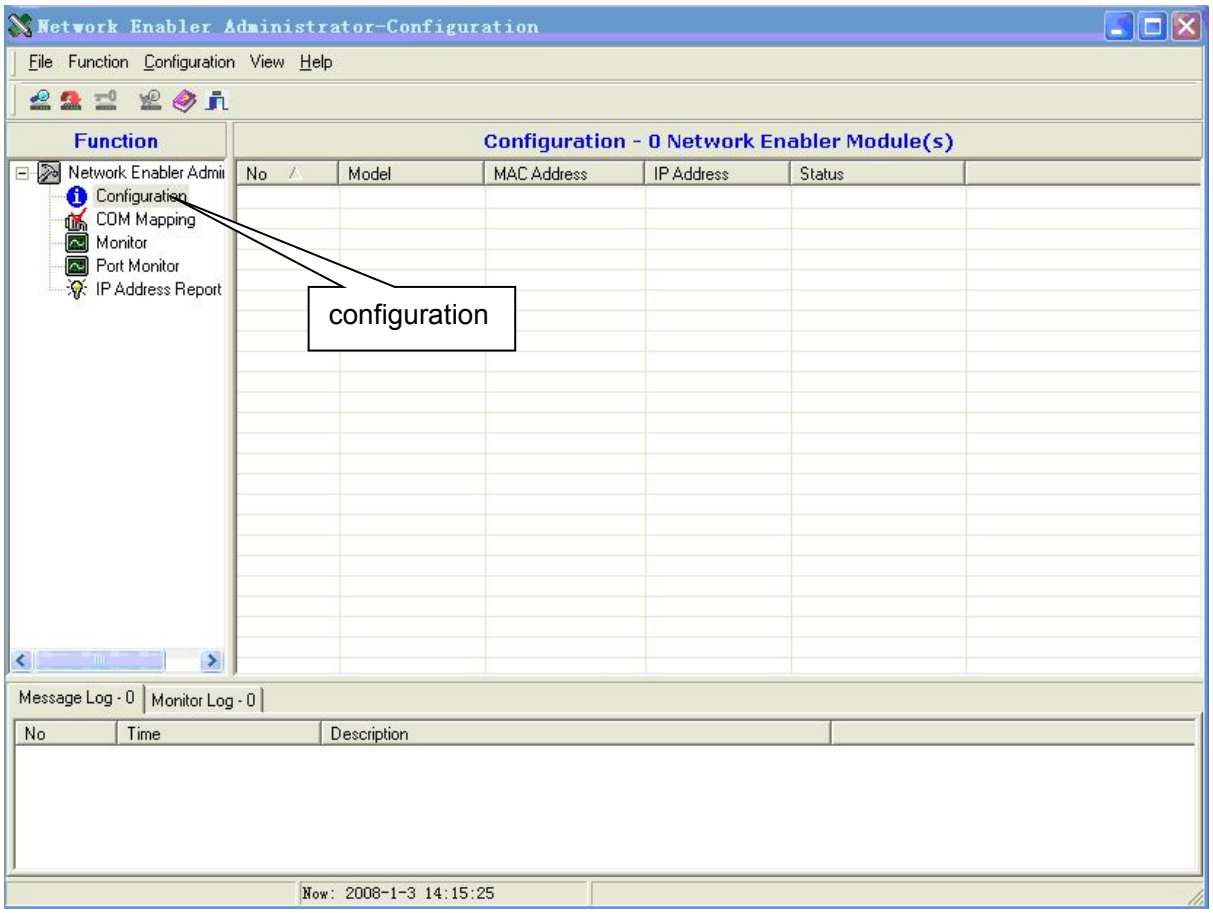
4) Run Upgrade.exe;
5) Press “open”, select upgrading program (*.bin) ofin computer;
6) Press “start”, the computer begins to upgrade software ofin instrument and the instrument screen prompts “Upgrade nowbegin”;

~~The instrument prompts “Configuring Mode…” during software upgrading.~~

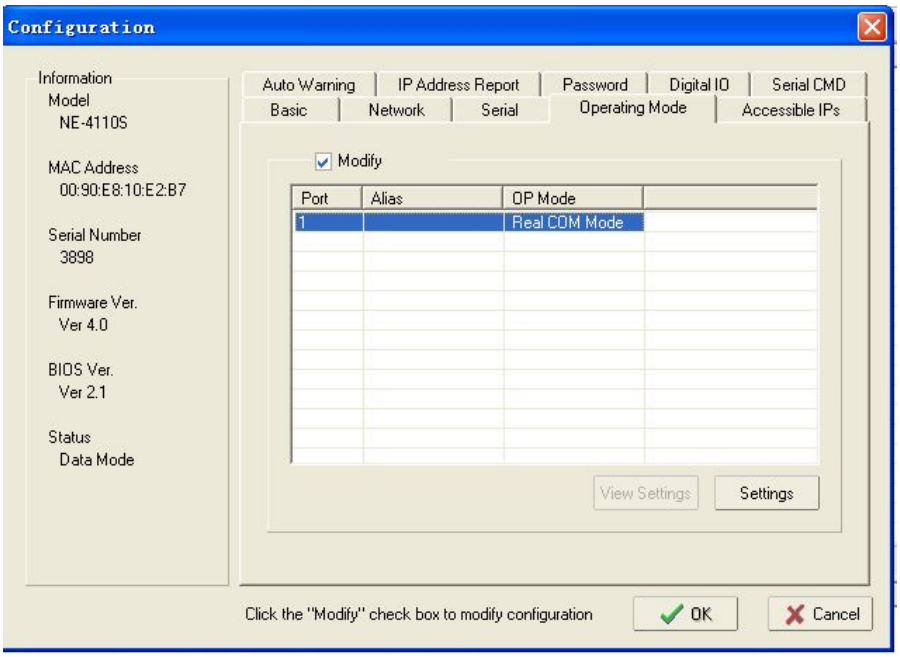
7) The instrument prompts “Upgrade finished…”when software upgrading is finished;
8) Firmware upgrading is finished;
9) Click remove device, remove device mapping;

10) Recover the configuration.

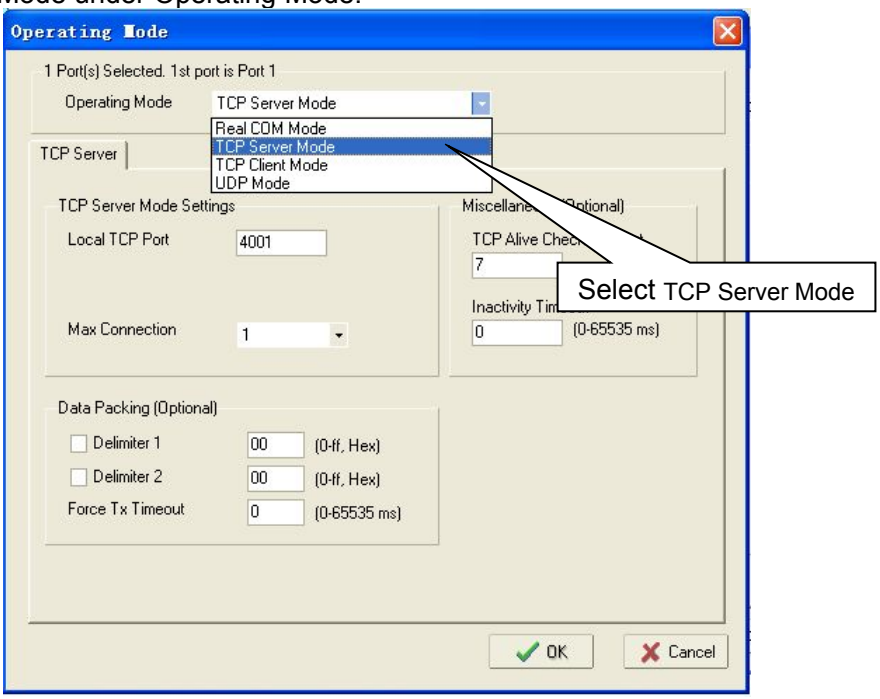
Open **Network Enabler Administrator**, select configuration function.



Double click network number searched in list column, open property page, and select Network.



Select TCP Server Mode under Operating Mode.



Click OK, close **Network Enabler Administrator.**

11) Restart the instrument, access interface ~~for~~ instrument system parameter setting, and set system parameters again.

Caution: Program version might upgrade without notice. User can visit www.bioer.com.cn to check and download the latest program version.
The device uses port 4001 as port number, please assure the port is not shielded.

Chapter VII Failure analysis and handling

This chapter introduces the failures the instrument might have, and the way to analyze and handle.

1. Failure analysis and handling

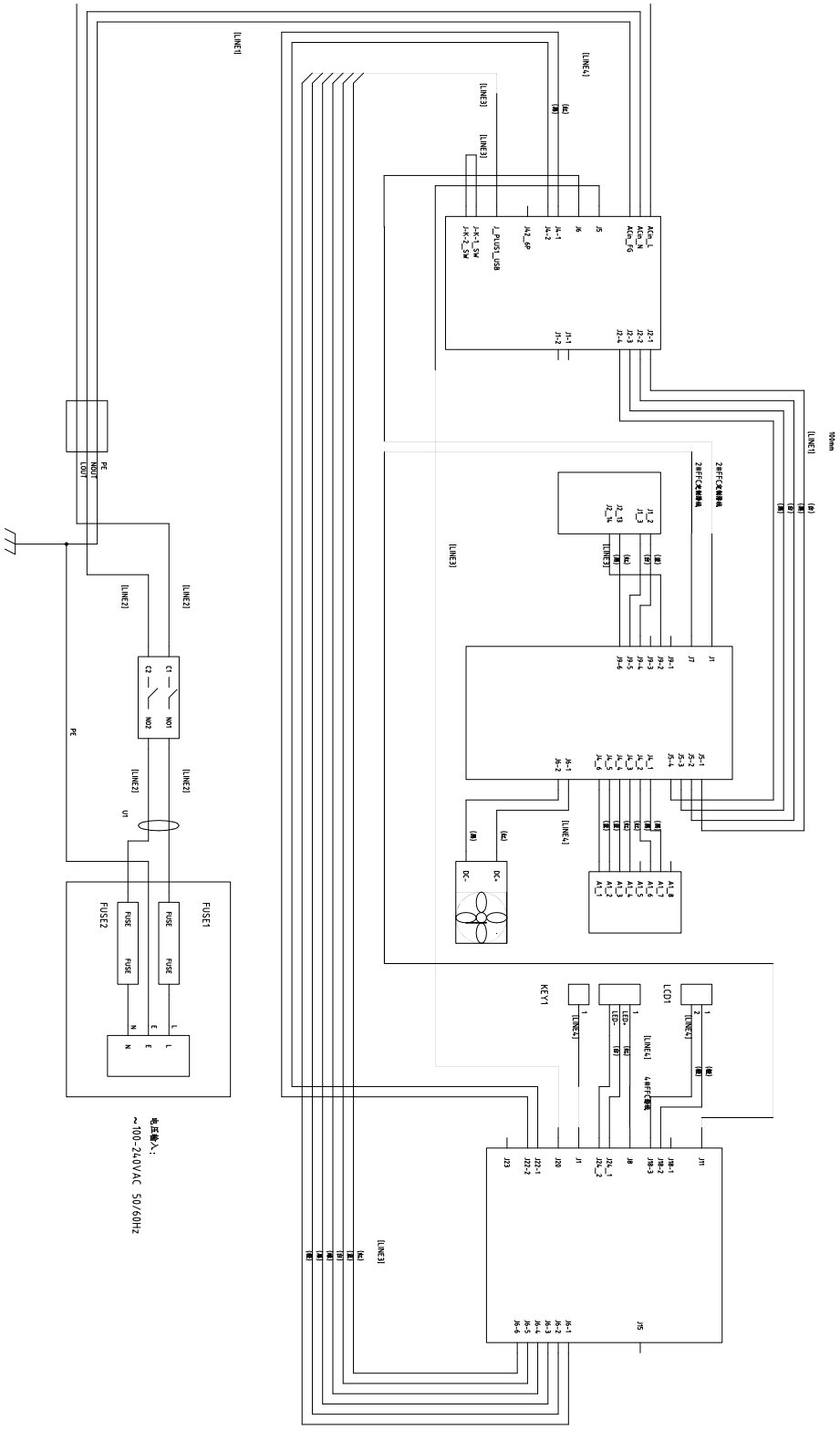
No	Failure	Analysis	Handling
1	The screen doesn't turn on and a "du-du" sound is not heard after power on	Power is not connected	Check power and connect
		Fuse is burnt	Replace fuse (250V, 8A, Φ5x20)
		Switch is damaged	Replace switch
		Others	Contact supplier or manufacturer
2	A "du-du" sound is heard after power on, "**Please insert Block**!" is shown on screen, a "du…" alarm is heard.	The plug that connects module and host machine is loose	Contact supplier or manufacturer
3	"**Please check error**" is shown on screen while file running, and one of the following is prompted: **"Temperature sensor disconnect"** **"Temperature sensor1 disconnect "** **"Temperature sensor2 disconnect "** **"Temperature sensor3 disconnect "**	Module sensor is damaged or in poor contact The extwrnal environment is too low will cause radiator alarm ,not instrument anomaly	Contact supplier or manufacturer
4	"**Please check error**" is shown on screen while file running, and **"Heat sink sensor disconnect"** is prompted	Heater sensor is damaged or in poor contact	Contact supplier or manufacturer
5	"**Please check error**" is shown on screen while file running, and **"Hotlid sensor disconnect"** is prompted.	Hot-lid sensor is damaged or in poor contact	Contact supplier or manufacturer
6	Rate of module temperature rise changes obviously or temperature control is not accurate	Ventilation hole is blocked	Remove things that block ventilation hole
		Connection wire is loose	Open the case, check connection wire, fasten the bolt on terminal if it is loose
		Refrigeration plate is damaged	Contact supplier or manufacturer
7	Rate of module temperature fall slows down obviously or it can't fall below room temperature	Ambient temperature or humidity is too high and exceeds the operation condition of instrument	Please adjust ambient temperature and humidity properly
		Refrigeration plate is damaged	Contact supplier or manufacturer
		Fan is damaged or doesn't run	
8	Module can't heat or cool	Temperature sensor is damaged	Contact supplier or manufacturer
		All refrigeration plates are damaged	

9	Hot-lid can't heat	Hot-lid status is set as "OFF" in system parameter setting interface	Set hot-lid status as a certain temperature
		Hot-lid closes automatically since temperature control time is set as "--:--" in file editing interface	Set temperature control time in digital form
		Hot plug-in is loose	Contact supplier or manufacturer
		Heating element in hot-lid is damaged	
		Temperature sensor in hot-lid is damaged	
10	Unusual character is shown on screen	Chip is in poor contact	Contact supplier or manufacturer
		Chip is damaged	
11	Button on panel can't work	Micro-switch is damaged	Contact supplier or manufacturer
12	Reagent in reaction tube evaporates	Hot-lid temperature is not set. Hot-lid is set as "OFF"	Set hot-lid temperature as per How to Set System Parameters in 1.2 of Chapter IV in this manual
		Reaction tube is not placed uniformly	Adjust hole position on reaction tube, try to place symmetrically
		Reaction tube is not covered tightly	Please cover reaction tube tightly before put into instrument
13	System parameter setting is invalid	It didn't press "Save" to confirm system parameter setting	Please refer to 1.2 of Chapter IV in this manual

Caution:
1. It is forbidden for user to open the case and check by oneself in warranty period. Please contact supplier or manufacturer in time if any failure needs to open the case to check.
2. Since temperature control characteristics (rate of temperature rise/fall, stability, fluctuation and etc.) of different brands and each instrument are specific, and biotic experiment itself has uncertainty and vulnerable to outside influence, PCR program that runs well on one instrument might fail to reach same effect on another. Therefore, please adjust PCR running program to get ideal performance once instrument is changed.

Attachment 1 Wiring diagram

(This diagram is for reference only and subjected to change without notice.)



Attachment 2 Value and Meaning of Parameter Setting

No	Parameter	Meaning	Scope of setting value	Note
1	Temp(C)	Temperature control point (Celsius)	4.0~99.0	
2	Time	Temperature control time (mm:ss)	--:-- (press plus/minus to set before :)	Temperature control time is infinitely long, close hot-lid at same time
			00：00~59：59	
3	Ramp(C/S)	Rate of temperature rise/fall (Celsius/second)	0.1 ~4.0	
			#.#	Maximum rate of temperature rise/fall
4	+Temp	Temperature increment in each cycle (Celsius)	0.0~9.9	
5	+Time	Time increment in each cycle (m:ss)	0:00~9:59	
6	Cycle1	Paragraph number	1~5	Cycle1：×00 From 00 to 00
	×00	Cycle times in this paragraph	1~99	
	From 00	First segment in this paragraph	X (any segment number already existed)	
	to 00	Last segment in this paragraph	≤X+15	
7	Grad.	Gradient temperature (Celsius)	0 ~30	
8	Date	Date (YY-MM-DD)	00（~99）-01（~12）-01（~31）	Year-month-day
9	Time	Time (HH:MM:SS)	00:00:00~23:59:59	Hour: minute: second
10	Default File	Default file name in system	11 characters in maximum length	
11	Default User	Default user name in system	11 characters in maximum length	
12	Control Mode	Temperature control mode	Block	In this mode (it comes to constant temperature status once it reaches target temperature), the time that reagent temperature at target temperature is less than time set (see Fig.1)
			Tube	In this mode (it comes to constant temperature status after 3°C overshoot once it reaches target temperature, the reagent temperature approaches target temperature quite fast (see Fig.2)
13	Sample Volume	Sample size (ul)	10~200	

14	Holid	Hot-lid off	Off	
		Hot-lid on (°C)	30~110	
15	Key Sound	Key tone (yes/no)	Yes/No	Buzz
16	Run End Sound	Prompt tone at running finish (yes/no)	Yes/No	Continuous buzz

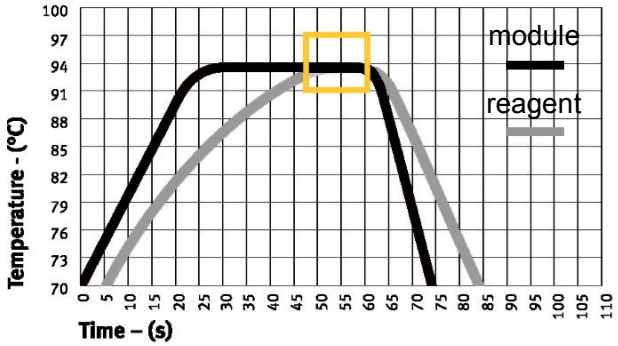


Fig.1

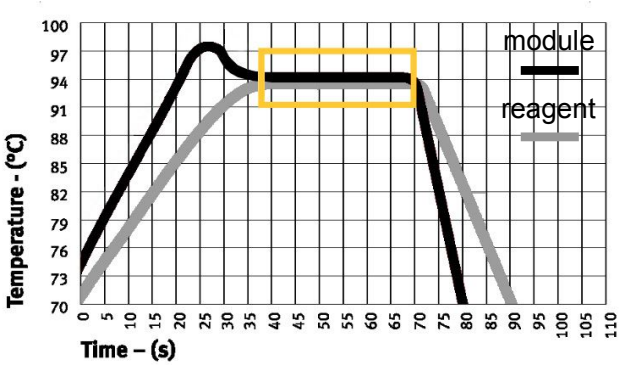


Fig.2

Note: In the tube mode, timing will start after overshoot is finished, and the temperature will be flashing during overshoot.

Memorandum